

Hitchcock's Machine Tool Blue Book

NOVEMBER, 1935

THIRTIETH YEAR



PROMPT
DELIVERY
FROM
STOCK

COLLETS
FOR YOUR
**LATHES AND
MILLING MACHINES**

Attractive Prices—Ask For Catalog No. 35

All styles in stock for Hendey, American, Monarch, Hardinge, Rockford, Sidney, Pratt & Whitney, South Bend, LeBlond, Springfield, Cincinnati, Sebastian, Etc., Lathes.

All styles in stock for Van Norman, Hardinge, Burke, Becker, Etc., Milling Machines.

● **Order from nearest stock — Stocks constantly maintained at:**

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HARDINGE SALES CO., INC.,	- 277 Lafayette Street,	- NEW YORK, NEW YORK
ECCLES & DAVIES MACHINERY CO., INC.,	1910 Santa Fe Ave.,	LOS ANGELES, CALIF.

PUBLISHED AT 508 So. DEARBORN ST. CHICAGO

ACCURACY FOR THE TOOL ROOM

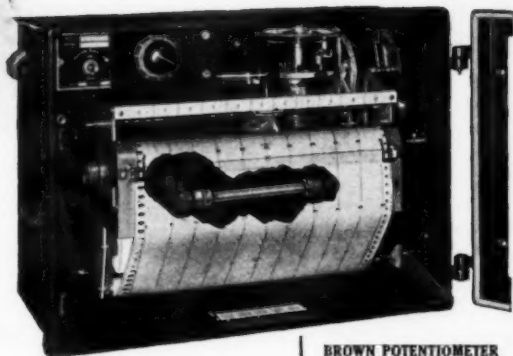
New!

WHITNEY
HAND MILLER



MANUFACTURED BY
W. H. NICHOLS • WALTHAM, MASS
U.S.A.

SPEED FOR PRODUCTION



**BROWN POTENTIOMETER
PYROMETER—**

*made by the Brown Instrument
Co., of Phila. Pa. Flexible shaft
couples motor to operating
mechanism.*

Coupling with S. S. WHITE flexible shafting

The instrument shown provides a typical example of this use of flexible shafting that is steadily increasing, because it usually simplifies design and reduces manufacturing costs.

We will be glad to furnish information about **flexible coupling shafts** — or about shafting for power drives or remote controls; also to cooperate with engineers in working out applications . . . no obligation . . . **WRITE** us.

● **The S. S. WHITE DENTAL MFG. CO.** ●
INDUSTRIAL DIVISION

10 East 40th St., Room 2310H, New York, N. Y.



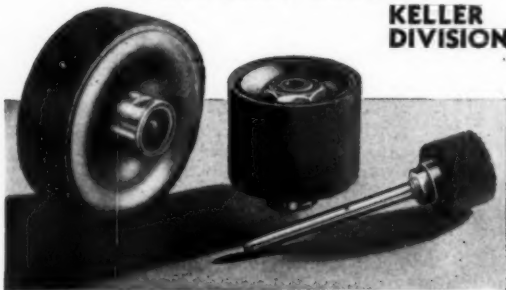
ABRASIVE BELTS AND SLEEVES

A new type belt of lapless construction. Used with rubber sanding and polishing drums and wheels, on steel, brass, bronze, aluminum, wood, etc. The drum is live rubber on which the abrasive belt is held by tightening a nut against compression washers. More economical and convenient to use than built up rag buffs.

Write for complete details on belts and drums

PRATT & WHITNEY CO.
HARTFORD, CONN.

**KELLER
DIVISION**



Hitchcock's Machine Tool Blue Book

**Selected
Circulation**

**20,000
Monthly**

NOVEMBER, 1935

THIRTIETH YEAR

Loans Up To \$50,000

Modernization Credit, under the National Housing Act, is available in amounts up to \$50,000, to be repaid monthly over a period of one to five years.

By taking advantage of this opportunity, the factory owner who is handicapped by inefficient equipment can now bring it up to date.

The loan may be used for improved machinery, better lighting, office equipment, improved power facilities, alterations, additions, etc.

For complete explanation, write to Robert B. Smith, Assistant to the Administrator, Federal Housing Administration, Washington, D. C., and ask for a copy of the new booklet entitled "Loans up to \$50,000".

Published By

Hitchcock Publishing Co.

508 S. Dearborn St.,

Chicago, Ill.

Consult the Classified Finding Index for your requirements

It Never Won A Beauty Contest



BUT THIS **RIDGID** WRENCH HAS WON HUNDREDS OF THOUSANDS OF USERS

Non-professionals buy nice shiny pipe wrenches. But you who work with wrenches, who "treat 'em rough", buy wrenches for performance. You appreciate the **RIDGID** guaranteed housing. No more breaking or warping wrenches out of commission, expense of repairs.

You constant users of wrenches like the accurate pipe scale on the **RIDGID** and the adjusting nut that *always* spins easily in its open housing in any size, 6" to 60".

You know the safety value of the powerful handle of double-strength Super-X alloy metal, and the replaceable jaws of chrome molybdenum tool steel with their instant grip and let-go, that you *can't* lock on a pipe.

Performance—not beauty. If you want to know what it really means, ask your jobber for a **RIDGID**.

The Ridge Tool Co., Elyria, Ohio, U.S.A.

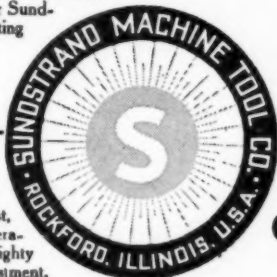
RIDGID PIPE TOOLS

SUNDSTRAND BALANCING TOOLS

Save time and money. Anti-friction discs; strong, well made, economical. Range in size from No. 1 Bench, with capacity for 800 lbs., to No. 5 Extra Heavy, with capacity for 24,000 lbs. Others available for balancing airplane propellers, balancing and drilling flywheels, pulleys, etc.

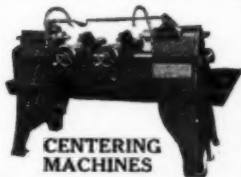


Write, *today*, for details on these and other Sundstrand cost-cutting products.



No. 56 illustrated, others available. Fast, accurate, an operation saver, a mighty profitable investment.

BENCH CENTERS



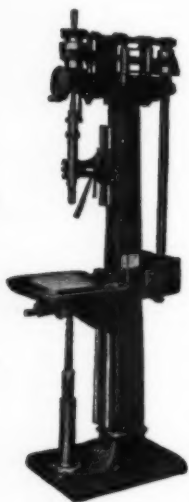
**CENTERING
MACHINES**

Accurate, compact, portable. Adjustable heads. Quick-acting spindle. Seven sizes.



These Sundstrand tools, like our Lathes and Milling Machines, cut costs and make work easier. " " " **INVESTIGATE!** Address our Dept. H for details.

FOOTBURT



A Single Spindle Footburt Sipp Sensitive Drill

**Made in three
sizes of single
and multiple
spindle models**

More holes with this machine

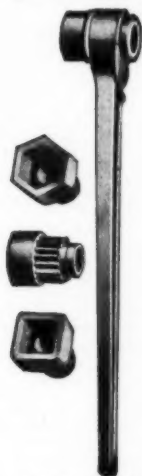
Why? Because you can change speeds in two seconds or belts in ten seconds—because the automatic idlers keep the belt pulling to capacity at all times—because the full ball bearing equipment and accurate machining gives a smooth, fast cut.

Write for No. 650 Folders

The Foote-Burt Company, Cleveland, O.

FOOTBURT

POWER and ACTION with COMPLETE SAFETY



When You Use The NEW SAFETY-STEEL **LOWELL WRENCH**

TRY A LOWELL WRENCH on your hardest job—whether it's steel construction, pipe coupling, timber bolting, cable clamps, staybolt caps, grease plugs, countersunk plugs, tunnel liner plates, culvert connections, wood tank or silo bands, railroad track bolting—anything that will give you a chance to see how it can take the toughest kind of punishment. The LOWELL will stand up under the greatest strains for it is made of an electrically treated metal of unusual strength. Has fully enclosed ratchet and parts with absolutely crushing action on hardened steel pawls.

**Will NOT Break — Successfully Resists a
Straight Pull of MORE THAN A TON!**

Actual tests have proved that a two-foot LOWELL Wrench will withstand a straight pull of from 2200 to 2400 pounds (equal to the combined pulling strength of ten husky men) without bending or breaking. You can depend on a LOWELL—it may bend to warn you, but it **WILL NOT BREAK!**

Write for Complete Information including Prices

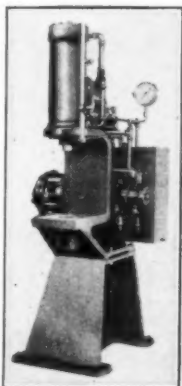
LOWELL WRENCH CO.
WORCESTER, MASSACHUSETTS, U. S. A.

Pump It Home SAFELY with a LOWELL

"GREENERD" HYDRAULIC, FORCING, BROACHING, AND PLASTIC MOLDING PRESS

The Greenerd Arbor Press Company of Nashua, N. H., announce their new No. 60 self-contained Hydraulic Press with pressure controls from $\frac{1}{2}$ to 15 tons on the down stroke and from $\frac{1}{2}$ to 13 tons on the up stroke.

The No. 60 Hydraulic Greenerd Arbor Press is versatile in its applications but it is particularly adaptable for assembly work, push or pull broaching, keyway cutting, and light plastic molding inasmuch as there is 15 tons pressure on the down stroke and may be held under even pressure until plastic sets, then released with a 13 ton pull to open the mold. Adjustments may be quickly made to control the desired pressure most suitable for different kinds of work up to 15 tons.



The frame and cylinder are constructed of a special semi-steel casting. The piston is made of steel with six cast iron piston rings. The ram gland is packed with chevron type packing with a bleeder pipe to take care of any seepage plus an extra wiper packing eliminating a seepage of oil on the ram.

The combination low and high pressure pump is driven by a 3 H.P. motor mounted on the side of frame with tank mounted at rear of press. The control valve is either foot or hand operated. Automatic or manual reverse can be made at any point in either direction. A stop rod also regulates the length of travel in either direction. When the ram is at top position the pump bypasses, relieving all pressure.

TWO NEW HAMMOND POLISHING LATHES

The Hammond Machinery Builders, Inc., Kalamazoo, Michigan, announce a new line of polishing lathes specially designed for automobile fender polishing, and other work of a similar nature requiring a wide swing lathe.

(Continued on Page 12)

Rolling Out PROFITS

That's the story—wherever Buffalo Bending Rolls are installed—they're **MAKING** money for their user!



And remember—it's not our story—it's the user's story!

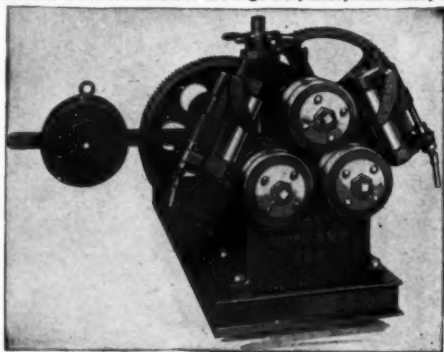
Write for Bulletin 351 to get ALL the information

BUFFALO FORGE COMPANY

161 Mortimer St.,

Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



**"Buffalo" Bending
ROLLS**

The accompanying illustrations show two of the most popular models, several of which have been recently installed in some of the larger automobile shops in and around Detroit.

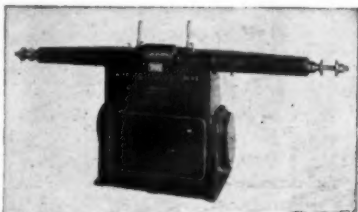
The Hammond Model RR Wide-Swing Two-Spindle Two-Motor Polishing Lathe has two independent spindles and two motors in base, one for each spindle, with V-belt drive from motors to spindle.

Made in three sizes for three to fifteen horse-power motors. Distance from side of base to inside of wheels, up to 30". Cut shows Model 5RR with five horse-power motors, spindles 107" long overall, distance from side of base to inside of wheels 30". Spindles mounted on over-size ball bearings. V-belts can be replaced without removing spindles or disturbing bearings on motors.

Hammond Model ROEH Wide-Swing Overhanging Spindle Polishing Lathe is designed for automobile fender

polishing or other work requiring large working space around wheels. Ten, fifteen or twenty horse-power motors are mounted in base, with V-belt drive to spindles. Spindle mounted on four over-size ball bearings,

which can be removed for replacing V-belts without opening bearing housings or disturbing motors. Cut shows Model 15 ROEH with fifteen horse-power motor in base. Spindle has 8" overhang from front of base and is 96" long overall with distance of 20" from side of base to inside of wheels.



(Continued on Page 14)

ATLAS DRILL PRESS DOES 5 HOUR JOB IN 2 HOURS



The Reynolds Electric Company, prominent electrical product manufacturers of Chicago, find Atlas Drill Press equipment efficient and economical. Manufacturing steel switch parts, they are tapping between eighteen hundred and two thousand 9-36 threads per hour with an Atlas Model 70. The press is running full time, eight hours a day. Its purchase represented a very large saving, the price being only a fraction of other equipment considered. On this same Atlas, Reynolds is now doing in two hours a tap job that formerly required five hours on a regular tapping outfit.

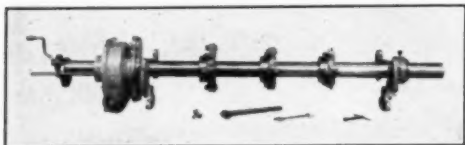
Atlas Drill Presses are standing up under this and many other similar jobs and maintaining their accuracy. They will do the same in your plant. Made in four sizes, bench and floor models. Prices range from \$14.45 to \$39.45. *See them at your jobbers or write direct for new 1936 catalog.*

ATLAS PRESS COMPANY

1850 N. Pitcher St., Kalamazoo, Mich.

Complete display at Atlas Sales Co., 35 E. Wacker Dr., Chicago

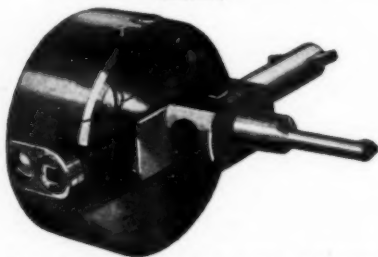
THE NEW FROUSSARD BORING BAR



The Multiple Boring Machine Company, St. Louis, Mo., announce the new Froussard Boring Bars which are the result of many years experience in building a machine of this type for boring locomotive cylinders and valve ports and pumps, engines and compressors. They embody all of the worthy improvements that have been made and are manufactured in a complete range of sizes for boring any size or type of cylinder.

With the new style centering device the bar can be readily set up for operation. The bar, which is made of high grade steel and ground to size, is driven by a Timken Bearing equipped worm gear speed reducer. The worm is made of tool steel and the gear of special gear bronze. The bar is so constructed that it may be used for many special jobs such as rifling cylinders, cutting threads and facing.

NO. 35 FLYNN MICROMETER OFFSET BORING HEADS



The Flynn Manufacturing Company of Detroit, Michigan, has developed a new boring head that is designed to do facing as well as boring. The body of the head is compact; $4\frac{7}{8}$ x 2 inches with a small tool block extending 1 inch from the face.

(Continued on Page 16)

KRW Hydraulic and Sensitive ARBOR PRESSES

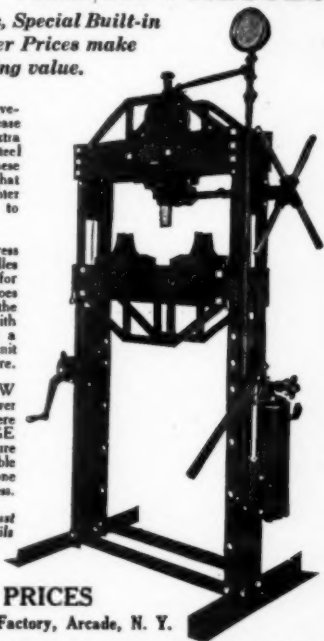
New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.

THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this KRW feature as a time and labor saver can be appreciated. Also there is **NO EXTRA CHARGE** for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.



PRICES

F. O. B. Factory, Arcade, N. Y.

- | | |
|---|----------|
| No. 37—35 ton Hydraulic and Sensitive Arbor Press (hand operated) | \$128.00 |
| No. 37B—35 ton Hydraulic and Sensitive Arbor Press (air-oil operated) | 128.00 |
| No. 37E—50 ton Hydraulic and Sensitive Arbor Press (hand operated) | 150.00 |
| (Can also be furnished in air-oil operated at same price) | |
| No. 37F—70 ton Hydraulic and Sensitive Arbor Press (hand oper. only) | 275.00 |
| Gauge and fittings, \$15.00 extra on all presses. | |

K. R. WILSON

10-16 Lock Street, Buffalo, N. Y., U. S. A.

EXPORT DEPARTMENT

90 West St., New York, N. Y.

WEST COAST BRANCH

722 Mateo St., Los Angeles

The tool block is built to hold a boring bar or tool in all sizes up to $\frac{3}{4}$ inch, either perpendicular or parallel to the face.

This feature, combined with the 2 inch micrometer offset that this head has, makes this new head a complete offset boring head.

NEW PRECISION BAND SAW WITH FILING ATTACHMENT

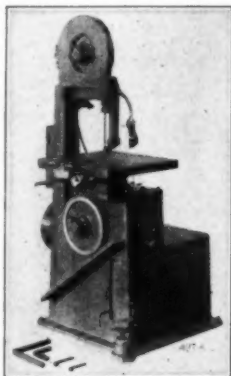
Neff Kohlbusch & Bissell, 2400 W. Madison St., Chicago, Ill., have recently placed on the market a new precision band saw with a continuous filing attachment for use in manufacturing dies.

The machine consists of two main parts, a box column which houses the motor drive arrangement, blower, feed-weights, etc., and the band saw unit comprising the work table, saw drums and drive members. The drive is taken by step cones through a worm and worm gear running in oil to the lower saw drum.

The saws range in width from $\frac{1}{8}$ " to $\frac{3}{8}$ " and are cut in suitable lengths from standard coils and joined by brazing. The upper saw drum is adjustable for 5" to permit the tensioning of the saw. The lengths of saws vary from 9' to 10'. An arrangement for automatic feed of the work is incorporated. This is operated from weights located in the column and a wire cable which pulls a pressure pin against the work holding frame.

The use of a band saw on external work is a well known operation. For internal work such as sawing out of dies, the saw is inserted through a previously drilled hole in the work and the ends are then joined by brazing. The saw is then introduced through a slit in the machine table, placed on the drums and tensioned. Suitable guides support the saw above and below the work. Both the operator and the machine are well protected by guards.

(Continued on Page 18)



**... For Stacking and Storage
of Boxes and Pans
USE STACKRACKS**



Write for circular.

*For prices specify
outside dimensions of
boxes to be stacked.*

*State approximate
weight of contents.*

Patents Pending

Saves Space, Time, and Labor

Store boxes and pans in an orderly manner—one on top of the other. Each stored unit is easily and quickly accessible as the top one...each stored unit can be moved, changed or replaced without disturbing any other.

The STACKRACK is ideal for use on assembly floor, in machine shop, under work bench, and for stockroom control. In fact, STACKRACKS can be used to advantage wherever you have a storage and stacking problem. STACKRACKS are made in single units. They are constructed of angle and formed steel parts, welded together. Each rack automatically locks securely in position on the rack underneath.

**STACKBIN
CORP.**

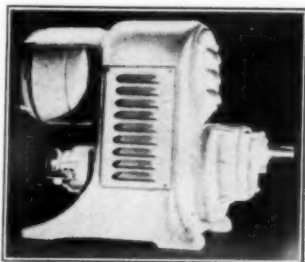


PROVIDENCE, R. I.

THE NEW "U. S." UPRIGHT VARIDRIVE MOTORS

An improved development in variable speed for use in many industries is announced by the U. S. Electrical Manufacturing Company, Los Angeles, Calif.

The U. S. Varidrive is now offered in the upright design. The advantage of the upright design over the commonly used horizontal design is a saving in lateral space. This design also gives the user the option of having the take-off shaft at either the high or low position. The horizontal design is used where the overhead space, rather than lateral space, is limited.



The U. S. Varidrive is described as "the motor of a thousand speeds" as infinite variations in speed with local or remote control are available.

DUMORE KG VARI-SPEED FLEXIBLE SHAFT TOOL

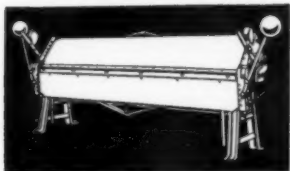
The Dumore Company, Racine, Wis., announce the new Dumore KG Vari-Speed Flexible Shaft Tool designed for tool makers, pattern makers, and other workers of metal and wood.

This new flexible shaft tool was brought out to fill the needs of operators who had to have a tool for finishing up dies, working out delicate lines and parts of metal, as well as wood patterns. Flexible in nature as well as in name, the shaft can be run while bent in a U shape. This permits the operator to work in "hard to get at" places.



(Continued on Page 20)

Chicago Steel Brakes



For 30 years the
Standard of the
World.

Over 30,000 in use.

Made in over 100
standard sizes.

Special Hand and Power Brakes Built for Irregular Work.
Submit Your Sheet Metal Bending Problems To Us.

DREIS & KRUMP MFG. CO.
7440 Loomis Blvd., CHICAGO, ILL.

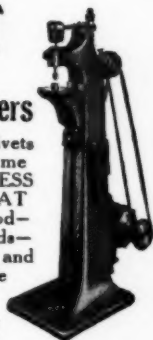


GRANT

Riveters--Pioneers

in their line—Head rivets
from smallest to $\frac{5}{8}$ " diame-
ter either by NOISELESS
SPINNING or VIBRAT-
ING HAMMER method—
Sizes to meet all needs—
Types include Vertical and
Horizontal Multiple
Spindles.

*Write for literature—and
don't forget to send
samples.*



The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

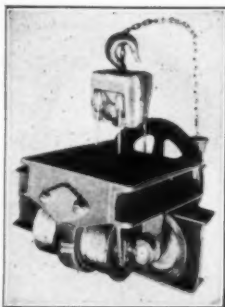
One of the interesting features of the Vari-Speed is its governor control. With a twist of the wrist, a speed range of from 1700 up to 12,000 RPM can be had, yet at all times the tool delivers its complete $\frac{1}{4}$ H.P. On higher speeds, the rotary files cut wood and softer metals, while on the lower speeds the files are ideal for iron, steel and the harder alloys. Mounted wheels are also driven at the correct peripheral speed for grinding.

The flexible shaft is 43" in length, and the hand piece is of ball bearing construction. Chuck has a $\frac{1}{4}$ " capacity and is of the collet type. The Vari-Speed is powered by a $\frac{1}{4}$ H.P. continuous duty Dumore Universal motor. Tool comes complete with a bail for hanging from a trolley or hook, however, a base can be furnished if desired.

SHAW-BOX TYPE "WR" HOISTS

The Shaw-Box Crane & Hoist Company, Inc., Muskegon, Mich., has recently developed a hand operated trolley hoist of a completely new design. This hoist has been designed to operate where headroom is limited and provides an exceptionally high hook lift. It can be used as a unit on either single girder cranes or on overhead I-beam monorail systems.

Contained in the design of this hoist are features unusual in a hoist of this type. Hoisting is accomplished through the medium of a steel cable and drum similar to that of large capacity cranes. This design eliminates the usual pocket wheel and chain; and also eliminates the bothersome tail chain which oftentimes becomes entangled in the load. The frame is built from steel ship channels and plates welded together to form a one-piece frame. The operating mechanism operates in oil and on ball bearings throughout. The effort required to raise capacity loads is unusually low—one man being able to handle loads up to two tons by pulling on the endless hand chain.

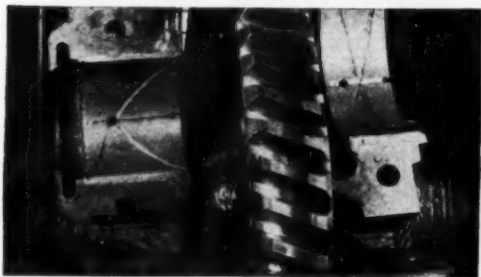


(Continued on Page 22)

TIMESAVER LAPPING COMPOUND

Produces

PERFECT FITS—QUIET OPERATION



For fitting gears, bearings, slides, pistons, etc.

WILL NOT IMBED OR CONTINUE TO CUT

Send for samples and literature.

TIMESAVER PRODUCTS CO., 33 So. Desplaines St.,
CHICAGO, ILL.

QUALITY  **SERVICE**

FLEXIBLE SHAFT MACHINES

Type
MP 5- $\frac{1}{4}$ H. P.



For
**ROTARY FILING
GRINDING
SANDING—POLISHING
DRILLING—REAMING
NUT SETTING
SCREW DRIVING AND
MANY OTHER OPERATIONS**

N. A. STRAND & CO.

MANUFACTURERS

5001-5009 No. Lincoln St., CHICAGO, ILL.

NEW GENERAL ELECTRIC CONTACTORS AND DRUM SWITCHES

General Electric, Schenectady, N. Y., announce three new control devices. The first is their new 2 h.p. multipole magnetic contactor, designated as Size 0. It is intended for use either with small single-phase and polyphase a.c. motors, or as a flexible relaying device for complicated control systems such as are used on machine tools.

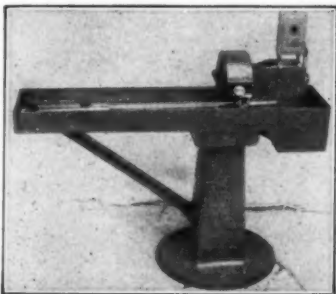
The new mill-type d.c. contactors are intended for the severe service to be encountered in steel mill applications, and are known as CR2800 contactors. They are constructed of heavy cold-rolled steel and are designed to facilitate inspection of parts.

The third device—CR3300 rotating drum switches—come in two lines, one for multi-speed and the other for reversing applications. The multi-speed switches are particularly suited to built-in applications, while the reversing switches are suitable for one, two and three-phase, reversing or non-reversing, and for two-speed non-reversing motors where an off-position contact is not required.

THE CHARLES EISLER HARD GLASS CUTTER

Cutting through various shaped bars, rods or tubes of hard glass, ceramics, metals and similar materials up to 2½ inches in diameter is a matter of a few seconds time with the new wet-disc cutter introduced by the Eisler Engineering Co., 769 So. 13th St., Newark, New Jersey.

The cutting tool of this machine consists of a thin abrasive wheel driven by a ¾ horsepower motor at a speed of 5,500 surface feet a minute. The wheel revolves within a cooling tank partially filled with water above the cutting level. An adjustable stop is furnished for accurately deter-



(Continued on Page 24)

New **WITTEK** High-Speed ROLL FEED for SMALL PUNCH PRESSES

POSITIVE ACTION, feeds accurately lengths from 0" to 12" per stroke. Handles coiled material from wire to 4-inch widths. Universal, for long or short stroke presses. Dependable at any speed that your presses will operate.

Complete with bolster, for presses with 7"x12" bed or smaller, \$115.00.

Also a complete line of larger feeds—single or double roll—with or without straightener—right or left, for all sizes and makes of presses.

WITTEK REEL STANDS

Are made in five types; Automatic self-centering, manual, ball bearing, plain bearing and disk type. All adjust to any angle and for height.

Model 4-S



\$115.00

Write for Bulletin FH

Complete with Bolster

WITTEK MFG. CO., 4305 W. 24th Place. CHICAGO



ARMSTRONG

MADE IN U.S.A. U.S. PAT. OFFICE

Drop Forged

WRENCHES



**50 Types
All Sizes
1 Quality**

DROP FORGED from selected steel, heat treated and accurately milled in improved designs. Each ARMSTRONG WRENCH must pass rigid inspection and tests, must prove worthy of the name "ARMSTRONG" or be destroyed. There are no ARMSTRONG "seconds." This name on a wrench can mean only "highest quality."

Write for Catalog B-35

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

308 N. Francisco Ave.,
New York Sales Office,

CHICAGO, U. S. A.
109 Lafayette Street

mining the correct cutting length. A quick acting clamp and long trough facilitate holding and handling the material.

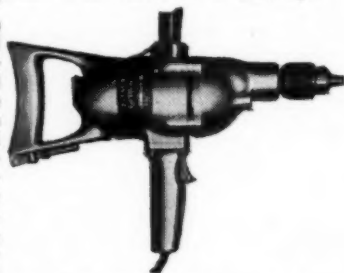
In cutting a rod it is first brought against the stop which locates it for cutting length. The clamping jaw is then closed about the rod, securely holding it as it is brought against the revolving cutting wheel under water. It is immediately severed, whereupon another section is moved into position. The operation may be performed continuously and with great rapidity, resulting in very fast production.

Wet-disc cutting as performed on the above machine not only is faster but has distinct advantages over dry cutting, saw cutting and other methods. As the cutting takes place under water the dust hazard is eliminated and burning of material avoided. Wheel speed is slower with a prolongation of wheel life due to the cooling effect of the water. A wider range of materials may be cut and a smooth surface cut produced.

BLACK & DECKER'S 1/2" JUNIOR DRILL

The Black & Decker Mfg. Co. has just announced the 1/2" Junior—a brand-new, popular priced drill as companion to the 1/4" Junior announced several months ago.

This new 1/2" Junior Drill is styled and priced to meet the widespread demand for a versatile tool adaptable to many drilling and cutting applications. It is proving exceptionally popular in the operation of hole saws as its low spindle speed and



powerful torque are perfectly adapted to the work of cutting clean round holes in wood, sheet metal, cast iron and composition materials. The 1/2" Junior is amply powered for drilling holes in steel up to 1/2" size; for driving wood augers up to 1 1/4" size. Its powerful universal motor operates on either alternating or direct current. Standard

(Continued on Page 26)



DRILLING MACHINES

SIZES

Stationary Head—14'-10"-21'

Sliding Head—14'-10"-32'-36'

These machines were formerly manufactured by the Rockford Machine Tool Company of Rockford, Illinois. Thousands of these machines have been installed and are giving universal satisfaction.

Also manufacturers of the Cleereman Automatically Oiled, Anti-Friction High Speed Drilling, Boring and Tapping Machines.

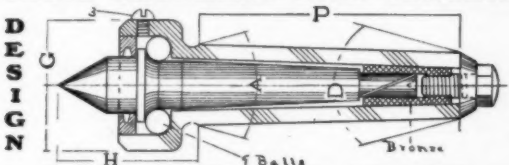
Builders of drilling equipment for over twenty years.

CLEEREMAN MACHINE TOOL COMPANY

Green Bay, Wisconsin

[Formerly Green Bay Barker Machine & Tool Works]

RIGID RESILIENT LIVE CENTER



RIGID TRIPLE-LIFE CENTER



IT OFFERS:

Long Life & Short Overhang

Short Life & Long Overhang

Saves $\frac{1}{3}$ on initial tool; $\frac{2}{3}$ on subsequent Inserts.

Rigid Tool Holder Co., 12281 Turner Ave. Detroit, Michigan

The Do-All is principally used for tool and die work, but is equally handy wherever it is necessary to cut out holes and shapes on flat material. It handles an infinite variety of jobs that heretofore have been slow, tedious and costly and makes them easy and economical. The machine is available in two models, a "heavy duty" Model J, and a lighter machine Model A. The manufacturers will be pleased to send complete information upon request.

NEW ALLIGATOR BELT CUTTER



An 8-inch flat belt cutting tool (U. S. Pat. 1,992,600), which employs a new principle in mechanical belt cutting, is announced by the Flexible Steel Lacing Company, 4607-31 Lexington Street, Chicago.

The cut is made by pushing the knife through the belt from one edge to the other. The knife is mounted on a plunger in a slot, as illustrated, and is operated easily by a direct arm push without mechanical leverage.

The knife goes "like cutting cheese" through most belting, but it will cut even the thickest and toughest belts up to 8 inches in width with surprisingly little effort. The knife, of special alloy steel, will make several thousand cuts and is easily replaceable.

The belt is held immovable by the equalizing clamp or hold down while the cut is being made. The clamp is also a guard for the blade. Clamp and frame are strongly built of aluminum alloy, the weight of the cutter being only 4 lbs. and 3 ozs.

The cutter is used either on the bench, as illustrated, or is up-ended on the floor, if desired.

(Continued on Page 30)

GEARS



Gears of all types accurately machined to specifications—including bevels... spurs... helicals... spirals... worms... wheels... and **ABART** world-famous **SPEED REDUCERS**. **ABART** operates a production shop for your satisfaction and service. *Write*

Abart **GEAR AND MACHINE CO.** 4832 WEST 16TH ST. CHICAGO, ILLINOIS
Makers of Speed Reducers and Gears of All Kinds



Acme Standardized Drill Jig Bushings



Acme Drill Jig Bushings are a standardized product, carried in stock for prompt delivery in over 6,700 standard items. They are completely finished and ready for use. The Bushings are made by the most exacting scientific methods, which insures long wear, accurate fit and absolute satisfaction. Special sizes made to order.

Send for our Bulletin, which gives complete details, sizes available, and low prices.

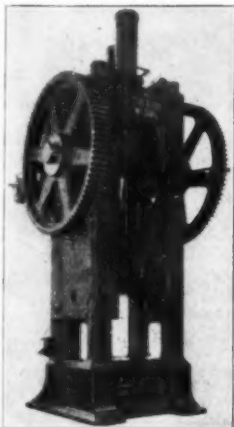


ACME INDUSTRIAL CO.
419 N. Carpenter St., Chicago



NEW "TOLEDO" STRAIGHT COLUMN PRESS

Improvements in design and in the selection of proper materials to give the best possible results, has been receiving the most careful consideration of all the leading machinery builders and this fact is apparent in a new series of straight column presses that has recently been placed on the market by The Toledo Machine and Tool Co., Toledo, Ohio. One of the machines of this series is shown in the accompanying illustration. Note the smooth harmonious lines of this press and the entire absence of projections of any kind beyond the base of the press. Particular attention is called to the design of the crown which has been heavily reinforced by making provision to extend the tie-rods through the top of the arch. The beds, uprights and slide have also strengthened, the diameter of the tie-rods has been increased and the crankshaft is of the semi-eccentric type with an extra large crank pin and heavy cheeks firmly supported close up to the frame of the press.



All cumbersome bearing brackets have been eliminated by mounting the flywheel and clutch mechanism high up out of the way between the uprights. Of course, gear guards are furnished for the gearing and some of the brackets for mounting them may be seen in the illustration.

The clutch is of a new patented air type mounted in the flywheel with electric push button control enabling the operator to stop or start the press at any point of the stroke or to inch the slide when setting or testing dies.

This press has 16-inch stroke with a 6-inch adjustment by power. The slide is 24 x 35 inches and is counterbalanced by two air cylinders shown at the top of the crown. The bed area is 50 x 43 inches. The weight of the press is approximately 150,000 pounds. A direct connected motor drives the press.

(Continued on Page 32)

Mall
Tool Co.

FLEXIBLE SHAFT EQUIPMENT



GRINDERS
SANDERS
POLISHERS

*A Size For
EVERY Job!*

Model No. 3524-D $\frac{3}{4}$ h.p., 3450 r.p.m., electric grinder with 6 ft. flexible shaft, tilting-swiveling castor base with tool tray. Can be furnished with interchangeable angle or straight spindles for sanding, polishing, or grinding.

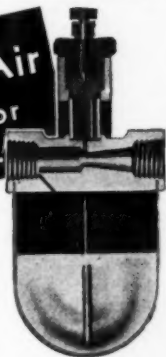
Also inquire about our low priced $\frac{1}{2}$ h. p. grinder.

Bulletins on request

MALL TOOL COMPANY,

7742 South Chicago Ave.,
CHICAGO, ILLINOIS

Oiled Air
a tonic for
your tools.



Oiled air stimulates tool energy—prolongs tool vitality. Feed every air tool and device a measured, adjustable amount of oil with the air that drives it, by means of a Norgren Sight Feed Automatic Air Line Lubricator. Keeps tools in condition, cuts repair costs, eliminates production delays due to "frozen" parts.

Sizes $\frac{1}{4}$ in. to $1\frac{1}{2}$ in., prices \$5.00 to \$24.00.
Two styles, horizontal and vertical.

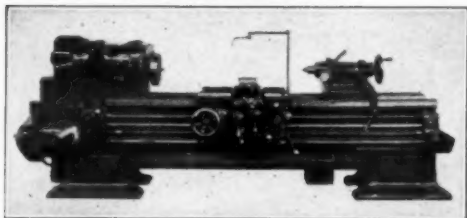
TRY IT AT OUR RISK!

C. A. NORGREN CO., (Inc.)

2012 Market Street,

Denver, Colorado

20-INCH SPRINGFIELD HEAVY DUTY, GEARED HEAD ENGINE LATHE



The above illustration shows a new Heavy Duty, 20-Inch Ball Bearing, Geared Head Engine Lathe, with Timken Bearings on spindle, as manufactured by The Springfield Machine Tool Company, Springfield, Ohio. This machine was designed to take heavy cuts with high speed steel and high speed cuts with carboloy.

The sixteen speed headstock is of massive design with either helical or spur gear trains, with pump to spray oil over the gears, shafts and bearings. The oil reservoir, instead of being located in the bottom of the headstock, is now carried in the first pocket of the bed, oil being pumped up from there through filters.

The reversing mechanism for the lead screw is now mounted on the rear of the headstock and can be readily examined; and one of the greatest features of this design is that it allows much heavier gears and shafts to be used. All of these gears are suspended on ball bearings and run in oil. A new heavy duty gear box is attached, giving thirty-six changes of threads and feeds, including $11\frac{1}{2}$.

The apron is of entirely new design with a front plate which can be removed, thereby allowing examination of all working parts. It also allows for a complete box construction of this unit, making for greater strength and accuracy. The oil pump and reservoir are carried in same, lubricating all bearings in the apron, carriage and lower slide of compound rest.

The carriage and compound rest have been made intentionally long and broad with ample bearing surfaces to carry exceedingly heavy pressures. This same idea has been carried into the tailstock and this machine has the heaviest tailstock ever designed for lathes of this size. The bed is in proportion to all other units and weighs 290 pounds to the foot and is $20\frac{1}{4}$ " across the vees.

Full Ball Bearing, Heavy Duty **HIGH SPEED SAWS**

These are new tools in speed sawing machines—heavy production equipment built to maintain terrific speeds hour after hour, year in and year out. They come with or without full automatic bar feed. Full ball bearing construction adds speed and assures permanent accuracy. Automatic stop. **FAST**—go thru up to 5 sq. in. of steel per minute.

Combination positive-and-friction **DUAL** power feeds, also hand screw feed.

MARVEL No. 6

6" x 6"

MARVEL No. 6A—Automatic Production Machine

MARVEL No. 6—Heavy-Duty Speed Saw

10" x 10"

MARVEL No. 9A—Automatic Production Machine

MARVEL No. 9—Heavy-Duty Speed Saw



Armstrong-Blum Mfg. Co.

"The Hack Saw People"

341 N. Francisco Ave., Chicago, U.S.A.



*Write for
Bulletin 600*

Angle Steel Stool Company Plainwell, Michigan

Manufacturers of Office and Factory Steel Equipment

Special Equipment built to your specifications

A COMPLETE LINE OF STEEL WORK BENCHES, Bench Legs and Bench Drawers

Our Steel Work Benches are available in all sizes for every purpose. They can be used as single units or in continuous lengths when attached end to end. Furnished with or without shelves and drawers. If you are in need of good, rigid, bench equipment drop us a line for full information.



Representatives in all principal cities

Chicago, 'phone Randolph 1570 Cleveland, 'phone Yellowstone 3426
New York City, 'phone Barclay 7-5559 or 7-5560

NEW SYNCRO POWER JIG-SAW

Recent developments in the jig-saw field have brought forward a general utility jig-saw with a self-contained power unit instead of the conventional motor. This new electric power tool, which is known as the Syncro Power Saw, operates from any 110-120 v. 60 cycle alternating current circuit using for its source of power a magnetic coil. It has been produced and placed on the market by Syncro Devices, Inc., Boydell Building, Detroit.

The new principle employed in the power unit of the Syncro Saw has caused widespread interest. A spring steel diaphragm, suspended over the magnetic coil, has its ends shackled in rubber. This diaphragm is the medium through

which the power is transmitted to the saw blade. The lower end of the saw blade is attached to the diaphragm and passes through a hole in the plate, having its upper end attached to the resilient return spring. The magnetic impulses of the alternating current act on the diaphragm, which is harmonically balanced with



the period of the current and produces the positive downward-cutting power stroke.

The Syncro Power Saw develops 7200 cutting strokes per minute, giving ease of control with an unusual sense of touch while sawing. The length of the power stroke may be set for a variation of from $\frac{1}{8}$ " to $\frac{1}{2}$ " for cutting different types of material. Length adjustment is obtained through the dampening effect of two adjustment nuts at each end of the diaphragm.

Syncro cuts rapidly through wood up to $\frac{1}{2}$ " in thickness, cutting smooth edges which need no sanding, due to the rapidity of action and positive downward working stroke of the saw blade. The radius is ample to accommodate the turning of working stock; a right angle or a circle $\frac{1}{16}$ " in diameter may be easily and accurately cut. An adjustable guide is standard equipment with the Syncro Power Saw—and with a little practice the operator can follow a most intricate fretsaw pattern. Thin metals also may be cut easily.

SMALL GEARS



ALSO
MEDIUM SIZES IN ALL TYPES
AND MATERIALS

Massachusetts Gear & Tool Co.
36 Nashua St. Woburn Mass.

SUPREME *Super-Duty* SHEAR BLADES

Poorly finished, inaccurate shear blades waste set-up time, cause needless changing and re-grinding and are short lived. For these reasons it will pay you to specify **SUPREME** Shear Blades as *precision* plays an important part in their manufacture.

are made to order to suit your requirements—for any make of Shear. They are manufactured in Laid Alloy and High Speed Steel, as well as Solid Steel.

Let us quote you on your shear blade requirements.

Send Us Your Next Inquiry

The Saw & Knife Specialty Co., Inc.
6526 Carnegie Ave., Cleveland, Ohio

NEW EQUIPMENT TABLOIDS

The manufacturers will be pleased to send full information upon request

The Ideal Commutator Dresser Co., Sycamore, Ill., have just issued a bulletin illustrating and describing their Ideal Universal Mica Undercutter. This electrically driven machine, with micrometer gauge, is used for servicing and undercutting commutator mica. In addition to the description of the Undercutter, the bulletin contains information of interest to men whose job it is to keep motors in repair. Copies may be obtained by writing the manufacturer.

"Farrel-Sykes Gear Generators" is the title of a new book which has just been published by the Farrel-Birmingham Co., Inc., Buffalo, N. Y. This handsomely printed book is essentially a condensed treatise on gear manufacture and its fifty-two pages, illustrated by eighty photographs and diagrams, contain much helpful information for engineers and operating executives who are responsible for the production of gears. A short history of the development of the Sykes Gear Generator which is included makes very interesting reading. If you are at all interested in the subject of gears, write the Farrel-Birmingham Co., for a copy.

A new booklet illustrating and describing all the newest developments in arc welding electrodes and accessories is announced by the Lincoln Electric Co., Cleveland, Ohio. It is virtually a condensed manual on arc welding giving complete descriptions, applications and procedures on electrodes for all welding purposes and in addition, details of all the latest arc welding accessories and supplies which facilitate use of the electric arc and increase the comfort of the operator. Copies are available without charge upon request to the Lincoln Electric Co.

"G-E Equipment for Machine Tools" is the title of Bulletin No. GEA-2196 published by the General Electric Company, Schenectady, N. M. Motors and control equipment are covered as well as recent developments in the field.

A 54-page lubricating equipment manual has just been issued by the Alemite Corporation, Chicago, Ill., showing each type of Alemite fitting, gun and hose, together with various accessories.

NEW!

SHOP SPOTLIGHT



Shop Spotlights
Are

100%

Adjustable
For Use In All
Factories—Shops—Offices

Models for
Wall and Bench
also
Punch Press
and
Drill Press

Price F. O. B. Factory:
Single Lots\$3.25 each
Lots of Six\$1.90 each

CHICAGO DIE CASTING MFG. CO.
2502 W. Monroe St., CHICAGO, ILL.



GENESEE

Adjustable

HOLLOW MILLS

Made In
7 Styles

to aid YOU
to REDUCE
FINISHING COSTS

**WRITE
US
TODAY**

on forgings, castings, etc. We design and manufacture hundreds of special and multiple operation production tools. Send us a sample of your work (blue prints will do) and we'll submit estimates showing guaranteed savings—and substantial ones too. Also ask for copy of our free catalog.

GENESEE MFG. CO. Inc., 141 N. Water St., ROCHESTER, N. Y.

New Equipment Tabloids—Continued

Catalog "S" presents the line of all-steel shears manufactured by the Cincinnati Shaper Co., Cincinnati, Ohio. It is illustrated and includes dimension sheet.

The Fellows Gear Shaper Co., Springfield, Vt., has recently developed a gear machine particularly designed for cutting hourglass worms for steering gears and reduction drives, at a high rate of production.

The same company also announces a new machine designed for lapping straight worms after hardening, with a capacity up to 4" in pitch diameter and 5" in thread length.

The Gray Machine Co., Philadelphia, Pa., have added two new sizes to their line of turret head metal cutters or nibbling machines. The first of the new models has an 18" throat with capacity for sheet metal up to $\frac{1}{4}$ " thick; the second has a 24" throat and capacity for sheet metal up to $\frac{1}{8}$ " thick.

The Automatic Machine Co., Bridgeport, Conn., announce a new vertical, six-station, revolving, turret-type diamond tool boring machine. This machine, to be known as Type B-131, is designed for large quantity machining of bearing holes in connecting rods, pistons, bushings, valves, refrigerator units, magneto housings and similar parts.

The Model K multiple spindle bar and chucking machine, built by the Cleveland Automatic Machine Co., Cleveland, Ohio, is designed with the purpose of obtaining tool room accuracy in production work. This machine is available in fourteen sizes, from $\frac{3}{8}$ " to $3\frac{3}{4}$ ", four-spindle and in eight sizes from $\frac{3}{8}$ " to $2\frac{1}{4}$ ", six-spindle.

A new automatic lathe is the latest addition to the stub lathe line manufactured by the Sundstrand Machine Tool Co., Rockford, Ill. The operating cycle of this new machine is automatic from the time the tools start their movement until they have completed their work and returned to their starting position. Cycle includes rapid approach, feed to depth, face, tool relief if desired, quick return and stop. The cycle can be arranged to repeat itself when automatic work attachments are used, by adjustments of a dog on the machine.

Gem Drill Press Vises

No. 1

Vise



Price

\$18.00

Made of Malleable Iron.

Tool steel jaws with "V" grooves and accurately ground.

Length over all.....	12"	Depth of jaws.....	2"
Width.....	4½"	Jaws open.....	3½"
Height.....	4"	Weight.....	18 lbs.

We also manufacture larger vises

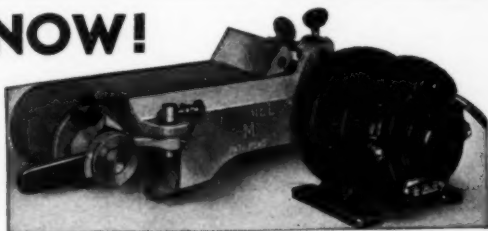
Circular on request

J. E. Martin Tool & Die Works

518 W. State St.,

Springfield, Ohio

NOW!



An Inexpensive

ABRASIVE BAND GRINDER—

"Built Like A Machine Tool"

The Hormel-M Grinder is sturdily built with a supporting leg under the grinding table to eliminate vibration and tipping due to pressure on belt. Ball bearing throughout, equipped with Alemite lubrication, complete with grease gun. Write for illustrated folder on this and other styles and sizes.

HORMEL-M GRINDER

WALLS SALES CORP., 96 Warren St., New York, N. Y.

New Equipment Tabloids—Continued

Oster-Williams, Cleveland, Ohio, have developed a bolt threading machine, both single- and double-spindle types, intended for high production on standard runs of bolts, as well as for use on an unusually wide variety of special work. The regular bolt range covers all sizes from $\frac{1}{2}$ " to $2\frac{1}{4}$ " and threading is done at spindle speeds of from 32 to 196 RPM. Spindle bore is $3\frac{1}{4}$ ".

The Rasmussen Machine Co., Racine, Wis., have developed a new power metal sawing machine that can be operated either as a fully automatic machine when employed for cutting off duplicate pieces from bar stock, or it can be set to complete one cut and to stop when cut is finished. The machine can also be used for deep slotting and similar work.

The Norton Co., Worcester, Mass., are placing on the market a new lapping machine to handle flat work measuring up to 3"x6" and cylindrical work in the same maximum dimensions. Parts to be lapped are mounted on special work holders and are held between the faces of the upper and lower laps, which rotate in opposite directions and at different speeds.

A new geared head engine lathe has been developed by the R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. Lathe has 12" and 14" swing, with eight speed changes, ranging from 20 RPM to 400 RPM.

The Foster Machine Co., Elkhart, Ind., announce a new turret lathe with hand or cam operated chuck and bar feed, to be known as the No. 1. Automatic chuck capacity is $1\frac{1}{8}$ " as standard, but can be increased to $1\frac{1}{4}$ ". Has eight spindle speeds, ranging from 300 RPM to 3,600 RPM.

Steel tubes, shapes, angles, flat stock up to $\frac{1}{8}$ " are cut with a saw blade on the new metal cutting machine designed by the DeWalt Products Corporation, Lancaster, Pa. Using an abrasive wheel, steel alloys such as stainless steel and high carbon steel up to 3" can be cut. Will also cut other metals such as copper, aluminum, brass, etc.

The Chas. F. Elmes Engineering Works, Chicago, Ill., announce a new straightening press to be known as Model 4103. It is fitted with removable tables and is rated at 160-ton capacity.



MENDES QUALITY DIAMONDS

Always Sharp

Reduce Grinding
Costs

Folder B on Request

Mendes Cutting Factories, Inc.
DIAMONDS AND DIAMOND TOOLS
505 Fifth Avenue. New York, N. Y.

Rep.: Milwaukee, Indianapolis, Cincinnati,
Pittsburgh, Baltimore.



T. H. L. Punches

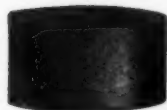
Insure Continuous and
Profitable Production

Because they are made of the right
quality of tool steel.

Because they are hardened with
every care.

Because all our experience of 43 years
is centered in making them ac-
curate, rugged and dependable.

Large stock of regular sizes
Special sizes quickly made



T. H. Lewthwaite Machine Co.
311 East 47th St., (Est. 1890) New York City

New Equipment Tabloids—Continued

Drilling, tapping, counterboring, reaming, milling and boiler tools are illustrated and described in Catalog No. 105, just issued by Scully-Jones & Co., Chicago, Ill. Detailed line drawings and engineering data, as well as a number of new developments in the tool industry are included.

"Norma-Hoffman Precision Needle Roller-Bearings" is the title of a bulletin issued by the Norma-Hoffman Bearings Corporation, Stamford, Conn., and describing the latest addition to their line.

The Hammond Mfg. Co., Cleveland, Ohio, have ready for distribution a leaflet illustrating and describing the No. 2 Hammond precision toolroom surface grinder. This machine was formerly a product of the Monarch Machine Tool Co., but its manufacture has been taken over by the Hammond Co.

To illustrate and describe their line of self-contained speed reducers, with integral or attached motors, the Allis-Chalmers Mfg. Co., Milwaukee, Wis., have published a booklet entitled "Gearmotors."

The Greaves-Klusman Tool Co., Cincinnati, Ohio, announce a new geared head engine lathe which is equipped with a bed designed to reduce the twisting and bending strains by means of heavy ribbing extending the full depth of the bed. Lathe is Timken equipped and comes in four sizes, 16"x6', 18"x6', 20"x8' and 22"x8'.

A hydraulic drilling machine, to be known as the No. 4, has been added to the line of the Leland-Gifford Co., Worcester, Mass. It is a box-column type machine, designed for drilling, reaming and facing in cast iron or for heavy production work in steel.

The Kingsbury Machine Tool Corp., Keene, N. H., announce a center column, automatic indexing type machine, designed to perform drilling, milling, threading and similar operations simultaneously and at a high rate of speed. These various operations are performed by units, each of which has self-contained drive and feed. This machine will handle a wide range of work as the units are easily located to suit requirements of various jobs.

Why Waste Time On Broken Taps ?



Every minute spent by your high-priced mechanics in digging out broken taps is a dead loss. When a tap breaks it should be *removed quickly with*

The Walton Tap Extractor

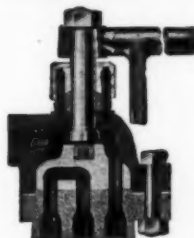
This handy tool has steel fingers which back out the tap *without injuring the threads*. It will save you many hours in the course of a year—paying for itself over and over again. Made in three and four-flute styles.

*Try One in YOUR SHOP—
Sent on 60-day Trial Basis*

The Walton Company

95 Allyn St.,

Hartford, Conn.



Two, Three and Fourway Valves

Foot Operated
Lever Operated
Also Solenoid Operated

It may be a simple matter to change a leather washer in an air valve to stop a bad leak, but it isn't the cost of the change that is important, it is the cost of the air lost during the weeks prior to the change. Further, this air loss and leather washer change in some makes of valves continues on year in and year out. Nicholson Valves are made of non-corrosive metals, are soap bubble tight, and remain so over periods as long as six years without maintenance of any kind.

Sent on trial. Bulletins on request.

W. H. Nicholson & Company
117 Oregon Street, Wilkes-Barre, Pa.

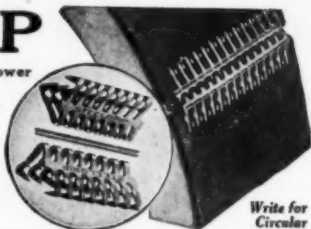
STEELGRIP

Flexible Belt Lacing

A stronger lacing for all power and conveyor belts:

1. A Stronger Lacing—treated-steel.
2. 2-piece hinged rocker pin takes UP WEAR.
3. Compresses Belt ends, prevents fraying. Eight sizes.

Armstrong - Bray & Co.
315 N. Sheldon St.,
CHICAGO, U. S. A.



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KEYWAYS CUT COMPLETE

with your
ARBOR PRESS

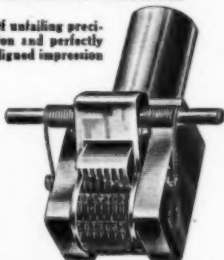
And Our Cutters in time required for
"SET UP" of larger Machines.

Bulletin on Request.

THREADWELL
Arch St., GREENFIELD, MASS.

NUMBERALL AUTOMATIC NUMBERING MACHINES

Of unflinching precision
and perfectly
aligned impression



The Numbers advance automatically.
For consecutively stamping Numbers
on Metal and other material. Used in
a punch press. Made with 3 to 10
wheels. All size figures.

Write for Circular and Price List
NUMBERALL STAMP & TOOL CO.
Huguenot Park, Staten Island, N. Y.

National TOOL SALVAGE Company SERVICE

Milling Cutters, Drills and Reamers reworked.
Tools exchanged on salvage basis.

SAVE 25% to 60%.

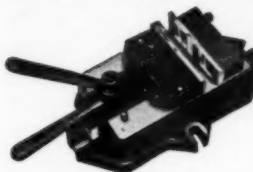
Write for information to:

3816 Beaubien St.,

Detroit, Mich.

Hartford Milling Vise

Power — Speed — Strength — Accuracy



Jaw width 5"
 Jaw depth 1¼"
 Maximum opening 3½"
 Weight 40 lbs

Power: Top eccentric handle furnishes tremendous binding power instantly.

Speed: Lower cam-faced handle gives immediate quick opening and return.

Strength: Steel parts are drop forged, hardened and ground—base is made of special iron. You can rely on the "Hartford" to stand up under hard usage.

Accuracy: All fitting parts are ground — alignment of jaws is absolutely certain.

Also made in the swivel-jaw type with hard or soft jaws, maximum opening 2¼".

Send for descriptive catalog illustrating its usefulness

We also Build Machinery on a Contract Basis and Design and Develop Special Automatic Machinery—Gears and Cams Cut to Order.

Hartford Special Machinery Co., 285 Homestead Ave., HARTFORD, CONN.



**HIGH
 SPEED
 DRILL
 PRESS**

TAPPING

**ATTACHMENT FOR
 BETTER TAPPING**

New tapping attachment taps holes perfectly at tremendous speed. Has friction drive and reverse with double-cone cork-faced clutch; ball bearings; balanced reversing mechanism. Simple to operate. Easy to maintain. Precision-made with all parts interchangeable. Three sizes. Many other styles for every need.

**PROCUNIER
 SAFETY CHUCK CO.**

14 So. Clinton St.,

CHICAGO, ILL.

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 for
 Literature

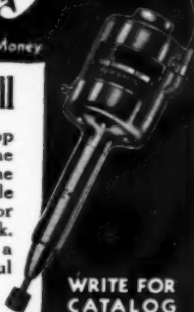
SpeedWay

More Tool for the Money

Portable
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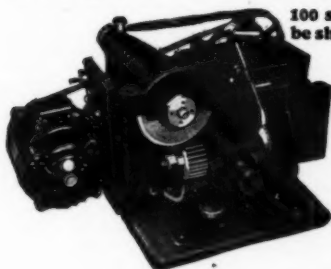
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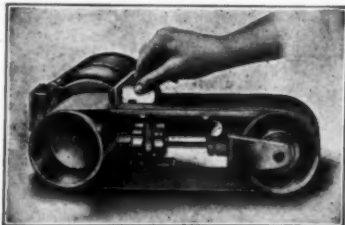
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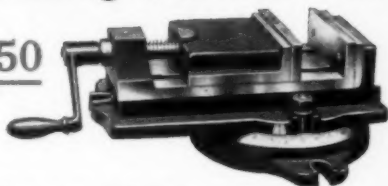
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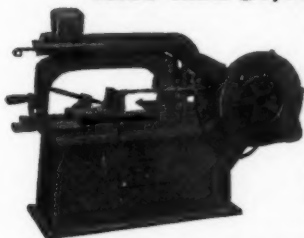
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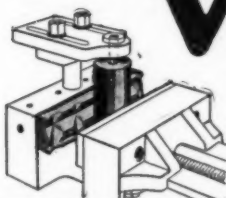


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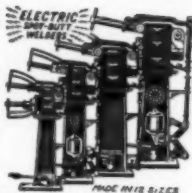
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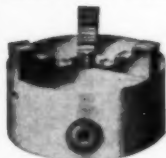
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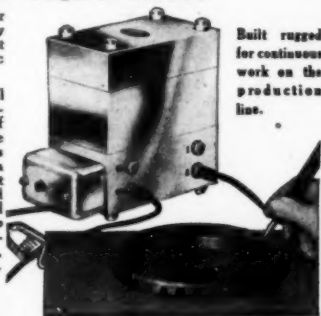
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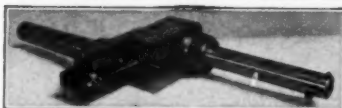


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116 S. Aberdeen St., Chicago, Ill.

Grinding Wheel Dressers, Diamond

Mendon Cutting Factories, Inc., 505 Fifth
Ave., New York City

Grinding Wheels, Mounted

Chicago Wheel & Mfg. Co., M.C. Tool Div.,
116 S. Aberdeen St., Chicago, Ill.

Grinding Wheels On Shanks

Chicago Wheel & Mfg. Co., M.C. Tool Div.,
116 S. Aberdeen St., Chicago, Ill.

Hack Saw Blades

Armstrong-Blum Mfg. Co., 841 N. Francisco
Ave., Chicago

W. Robertson Mch. & Fdry. Co., Buffalo, N. Y.

Hack Saw Machines

Armstrong-Blum Mfg. Co., 841 N. Francisco
Ave., Chicago

W. Robertson Mch. & Fdry. Co., Buffalo, N. Y.

Hand Screw Machines, Precision

Bench Type
Hardinge Brothers, Inc., Elmira, N. Y.

Heads, Boring

Flynn Manufacturing Co., Detroit, Mich.

Hoists, Portable

Sampson Tool Co., Inc., 101 Walker St.,
New York, N. Y.

Hollow Adjustable Mills

Genesee Mfg. Co., Rochester, N. Y.

Index Centers

Wm. Carroll & Son, Norwood, Cincinnati, O.

Jigs and Fixtures

American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mch. Co., Hartford, Conn.

Keyway Cutters

Threadwell Tap & Die Co., Greenfield, Mass.

Knurls and Holders, for Turrets

Graham Manufacturing Co., Providence, R. I.

Lapping Compound

Timesaver Products Co., 22 So. Desplaines
St., Chicago

Lathe Centers

Rigid Tool Holder Co., Detroit, Mich.

Lathe Chip Pans

Angle Steel Stool Co., Plainwell, Mich.

Lathe Drives

Cushman Wheel Co., 1359 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Bench

Atlas Press Co., Kalamazoo, Mich.
Sheldon Machine Co., 3255 Cottage Grove
Ave., Chicago, Ill.

Lathes, Manufacturing

Bondstrand Machine Tool Co., Rockford, Ill.

Lathes, Precision Bench

Hardinge Brothers, Inc., Elmira, N. Y.
Wade Tool Co., Waltham, Mass.

Lathes, Precision Bench Screw

Cutting
Hardinge Brothers, Inc., Elmira, N. Y.

Leader Pins, Steel

Aeme Industrial Co., 419 N. Carpenter St.,
Chicago, Ill.

Lubricator, Automatic

Norgren Co., C. A., Denver, Colo.

Machine Knives

Saw & Knife Specialty Co., Cleveland, Ohio

Machine Shop Lights

Chicago Die Casting Mfg. Co., 2302 West
Monroe, Chicago, Ill.

Machine Tender Stands

Angle Steel Stool Co., Plainwell, Mich.

Mandrels, Expanding

W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Micrometers

Bradley Machinery Co., Detroit, Mich.

Milling Attachments

Burke Machine Tool Co., Connecticut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench

Burke Machine Tool Co., Connecticut, Ohio
Bondstrand Machine Tool Co., Rockford, Ill.

Classified Finding Index

Milling Machines, Precision Bench

Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Hand

Burke Machine Tool Co., Conneaut, Ohio
Nichols, W. H., Waltham, Mass.
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Plain

Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Mills, Adjustable Hollow

Genesco Mfg. Co., Rochester, N. Y.

Motors, Electric Ball Bearing

Valley Electric Corp., St. Louis, Mo.

Moulds & Ladles, Hammer and Vise.

Johnston Tool Co., East Providence, R. I.

Nibbling Machines

Libert Machine Co., Green Bay, Wis.

Numbering Machines

Numberall Stamp & Tool Co., Staten Island, N. Y.

Pigeon Hole Sections

Angle Steel Stool Co., Plainwell, Mich.

Pins, Leader And Dowel

Arme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Pipe Cutters

Ridge Tool Co., Elyria, Ohio

Pipe Vises

Ridge Tool Co., Elyria, Ohio

Pipe Wrenches

Ridge Tool Co., Elyria, Ohio

Press Brakes

Drels & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 8885 Cottage Grove Ave., Chicago, Ill.
Wilson, R. K., Buffalo, N. Y.

Presses, Power

Drels & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Punch

Drels & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lewthwaite Mch. Co., T. H., 811 E. 47th., N. Y.

Production Tools

Genesco Mfg. Co., Rochester, N. Y.

Pullers, Gear and Wheel

Armstrong-Bray & Co., 815 N. Sheldon St., Chicago, Ill.

Punch Press Feeds

Wittak Mfg. Co., 4809 W. 24th Place, Chgo.

Punch, Shear and Bender, Hand

Armstrong-Hum Mfg. Co., 841 N. Francisco Ave., Chicago

Punches, Hand

Armstrong-Hum Mfg. Co., 841 N. Francisco Ave., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mch. Co., T. H., 811 E. 47th., New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies

Lewthwaite Mch. Co., T. H., 811 E. 47th., N. Y.

Punches and Shears

Sampson Tool Co., Inc., 101 Walker St., New York, N. Y.

Pyrometers

Illinois Testing Laboratories, Inc., 160 W. Austin Ave., Chicago

Pyrometers, Portable & Stationary

Illinois Testing Laboratories, Inc., 160 W. Austin Ave., Chicago, Ill.

Racks, Cut

Massachusetts Gear & Tool Co., Woburn, Mass.

Reamer Holders

W. H. Nicholson & Co., Wilkes-Barre, Pa.

Reamers

Harad Tool & Supply Co., 174 Lafayette St., New York City

Riveters, Multiple Spindle

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Riveters, Pneumatic

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Rad Cutters

Armstrong-Hum Mfg. Co., 841 N. Francisco Ave., Chicago
Lewthwaite Mch. Co., T. H., 811 E. 47th., N. Y.

Classified Finding Index

Saws, Band and Circular for Metal

Saw & Knife Specialty Co., Cleveland, Ohio

Saw Sharpening Machines

Wardwell Manufacturing Co., Cleveland, O.

Shafts, Flexible

Strand Co., N. A., 5001 N. Lincoln St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street,
New York, N. Y.

Shaping Machines

Osborne & Sexton Machy. Co., Columbus, O.

Shear Blades

Saw & Knife Specialty Co., Cleveland, Ohio

Shears

Libert Machine Co., Green Bay, Wis.

Shears, Hand

Armstrong-Hum Mfg. Co. 341 N. Francisco
Av., Chicago
Lowthwaite Machine Co., T. H., 311 E. 47th
St., New York
Whitney Metal Tool Co., Rockford, Ill.

Shear, Power

Dreis & Krump Mfg. Co., 7440 Loomis
Bvd., Chicago, Ill.
Libert Machine Co., Green Bay, Wis.

Shears, Slitting

Dreis & Krump Mfg. Co., 7440 Loomis
Bvd., Chicago, Ill.

Sheet Metal Machinery

Libert Machine Co., Green Bay, Wis.

Shop Spotlights

Chicago Die Casting Mfg. Co., 2502 West
Monroe, Chicago, Ill.

Special Tools and Machinery

American Tool Works, Inc., Hartford, Conn.
Wade Tool Co., Waltham, Mass.

Speed Reducers

Abert Gear & Machine Co., Cicero, Ill.
Chicago Gear Works, 709 W. Jackson Bvd.,
Chicago
Cullman Wheel Co., 1859 Altgeld St., Chgo.
Ohio Gear Co., Cleveland, Ohio

Spot Welding Machines, Speed.

Elster Engineering Co., Inc., Newark, N. J.
Taylor-Winfield Corp., Warren, Ohio

Sprckets

Chicago Gear Works, 709 W. Jackson Bvd.,
Chicago
Cullman Wheel Co., 1859 Altgeld St., Chgo.
Massachusetts Gear & Tool Co., Woburn,
Mass.
Ohio Gear Co., Cleveland, Ohio

Stampings

Gerding Brothers, Cincinnati, Ohio

Stools and Chairs

Angle Steel Stool Co., Plainwell, Mich.

Straightening Machines

Whitney Metal Tool Co., Rockford, Ill.

Stud Setters

Procurer Safety Chuck Co., 14 S. Clinton
St., Chicago

Tables

Angle Steel Stool Co., Plainwell, Mich.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Holders

Procurer Safety Chuck Co., 14 S. Clinton
St., Chicago, Ill.

Tapping Attachments

Procurer Safety Chuck Co., 14 S. Clinton
St., Chicago, Ill.

Tapping Jigs, Universal

Heuser Mfg. Co., 1638 No. Paulina St.,
Chicago, Ill.

Tapping Machines and Attachments

Borke Machine Tool Co., Conneaut, Ohio
Cleereman Mche. Tool Co., Green Bay, Wis.
Procurer Safety Chuck Co., 14 S. Clinton
St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type

Illinois Testing Laboratories, Inc., 150 West
Austin Ave., Chicago, Ill.

Threading Machines, Automatic, Stud

Grant Mfg. & Mche. Co. Bridgeport, Conn.

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ridge Tool Co., Elyria, Ohio.

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Rigid Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tool Post Grinders

De Witt Tool Co., 252 La Fayette St.,
New York, N. Y.

Tools, Abrasive

White Dental Mfg. Co., 10 E. 40th Street,
New York, N. Y.

Tools, Boring

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago

Tube Flanging Machines

Grant Mfg. & Mche. Co., Bridgeport, Conn.

Trucks

Angle Steel Stool Co., Plainwell, Mich.

Universal Drill Jigs

Heuser Mfg. Co., 1638 No. Paulina St.,
Chicago, Ill.

Universal Joints

American Tool Works, Inc., Hartford, Conn.
Chicago Gear Works, 709 W. Jackson Bvd.,
Chicago

Classified Finding Index

Used and Rebuilt Machinery

Alamo Engine Co., Hilldale, Mich.
 American Machinery Co., Cleveland, Ohio
 Atlas Equipment Co., 114 S. Clinton, Chgo.
 Barad Tool & Supply Co., 174 Lafayette St.,
 New York City
 Belyea Co., Inc., 150 W. 18th St., New York,
 N. Y.
 Blosser Mfg. & Mchry. Co., Springfield, Ill.
 Brotherhood & Son, Ferry St., 114 Liberty
 St., New York, N. Y.
 Brown Machinery Co., St. Louis, Mo.
 Brownell Machinery Co., Providence, R. I.
 Cincinnati Mchry. & Supply Co., Cincinnati, O.
 Clinton Mchry. Co., 23 S. Clinton St., Chgo.
 Consolidated Used Machinery Mart, 440 N.
 Cass St., Chicago, Ill.
 Craig, Jr., Thomas H. Bridgeport, Conn.
 Davis Machinery Co., Toledo, Ohio
 Denny, W. I., 618 W. Lake St., Chicago
 Detroit Manufacturers Supply Co., Detroit
 DeWitt Tool Co., 252 Lafayette St., New
 York City
 Eastern Machinery Co., Cincinnati, O.
 Emerson, Louis E. & Co., 1741 Elston
 Ave., Chicago, Ill.
 Esley Machinery Co., E. L., 825 Mea St.,
 Chicago, Ill.
 George, James W., Detroit, Mich.
 Goldman, Harvey H., Detroit, Mich.
 Grand Machinery Exchange, Inc., 140 Centre
 St., New York City
 Hammond Machinery Builders, Kalamazoo,
 Mich.
 Harben Machinery Equipment Co., 30 R.
 Clinton St., Chicago, Ill.
 Haas-Schenk Co., Cleveland, Ohio
 Hill, Clarke & Co., 845 W. Washington Blvd.,
 Chicago, Ill.
 Ideal Machinery Co., Plainwell, Conn.
 Indianapolis Machinery & Supply Company,
 Indianapolis, Ind.
 International Machinery Co., Detroit, Mich.
 Interstate Mchry. Co., 130 S. Clinton, Chgo.
 Iroquois Machinery Co., Buffalo, N. Y.
 Johnson & Sons Machinery Co., Wm. C.,
 St. Louis, Mo.
 Jones Machine Tool Co., Cincinnati, Ohio
 Kennard-Halkin Mchry. Corp., 160 Liberty
 St., New York, N. Y.
 Klauber Mchry. Co., E. L., St. Louis, Mo.
 Long Machinery Corporation, Boston, Mass.
 Lucas & Son, J. L., Bridgeport, Conn.
 McDonald Machinery Co., St. Louis
 McGill Machine Co., Hinghamton, N. Y.
 Merr-Gaibrecht Mchry. Co., Pittsburgh, Pa.
 Meyer Blower Co., Wm. W., 1045 West
 Washington Blvd., Chicago, Ill.
 Midwest Equipment Co., 635 W. Lake St.,
 Chicago, Ill.
 Mid-West Machine Tool & Supply Company,
 Davenport, Iowa
 Millholland Sales & Mchry. Co., Indianapolis,
 Ind.
 Miles Machinery Co., Saginaw, W. S., Mich.
 Mottler Machinery Co., Chas. L., 120-124 S.
 Clinton St., Chicago
 Morey & Co., 45 Mill St., Astoria, Long
 Island, N. Y.
 Noble Machinery Co., 217 Centre St., New
 York, N. Y.
 Norton-Broadway Machinery Co., Cincinnati,
 Ohio
 O'Brien Machinery Co., Philadelphia
 Ohio Mchry. & Supply Co., Cincinnati, Ohio
 Ott Machinery Sales Co., Detroit, Mich.
 Osborne & Sexton Mchry. Co., Columbus, O.
 Pattison Supply Co., W. M., Cleveland, O.
 Reliance Machinery Sales Co., Pittsburgh,
 Pa.
 Reynolds & Son, Geo. T., Providence, R. I.
 Rittenbush & Co., Inc., 30 Church Street,
 New York City
 Riverside Machinery Depot, Detroit, Mich.
 Roll, W. C., Cincinnati, Ohio
 Rosenkrans & Weisbecker, 2300 A. Singer
 Bldg., New York City
 Russell Machine Co., Pittsburgh, Pa.
 Scott-Bensbach Mchry. Co., 4607 W. 20th St.,
 Chicago
 Segal Machinery Co., 309 W. Lake St.,
 Chicago, Ill.

Used and Rebuilt Machinery—Cont.

Simmons Machine Tool Corp., Albany, N. Y.
 Strong, Carlisle & Hammond Co., Cleveland,
 Ohio
 Sun Machinery Co., 28 Van Buren Street,
 Newark, N. J.
 Surplus Stock & Mchry. Co., 1133 W. Lake
 St., Chicago
 Surplus Material & Mchry. Co., Detroit, Mich.
 Thompson, S. A., Fort Wayne, Ind.
 United Mchry. & Supply Co., St. Louis, Mo.
 Victor Machinery Co., 129 S. Clinton Street,
 Chicago, Ill.
 Victor Machinery Exchange, 251 Center St.,
 New York City
 West Penn Machinery Co., Pittsburgh, Pa.
 White Mchry. Co., A. D., 108 N. Jefferson
 St., Chicago
 Wisner Mchry. Co., Inc., 237 Centre St.,
 New York City
 Wigglesworth Mchry. Co., Cambridge, Mass.
 Wolnick Machinery Sales, 21st & Marshall
 Blvd., Chicago, Ill.

Valves, Feet, Lever & Solenoid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Vices, Drilling Machine

Armstrong-Hum Mfg. Co., 541 N. Francisco
 Ave., Chicago
 Armstrong Bros. Tool Co., 308 N. Francisco
 Ave., Chicago
 Graham Manufacturing Co., Providence, R. I.
 Heuser Mfg. Co., 1838 No. Paulina St.,
 Chicago, Ill.
 L-W Chuck Co., Toledo, Ohio
 Martin Tool & Die Works, J. E., Springfield, O.
 Sampson Tool Co., Inc., 101 Walker St.,
 New York, N. Y.
 Sheldon Machine Co., 3255 Cottage Grove
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Vices, Drill

Johnson Tool Co., East Providence, R. I.

Vices, Machinists'

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Vices, Milling Machine

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 Hartford Special Mchry. Co., Hartford, Conn.
 L-W Chuck Co., Toledo, Ohio
 Sheldon Machine Co., 3255 Cottage Grove
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Vices, Shaper

Graham Manufacturing Co., Providence, R. I.
 L-W Chuck Co., Toledo, Ohio

Waste Cans

Angie Steel Stool Co., Plainwell, Mich.

Welding Machines, Electric Spot

Eisler Engineering Co., Inc., Newark, N. J.

Welding Machines, Resistance

Eisler Engineering Co., Inc., Newark, N. J.

Wheel Dressing Diamonds

Mendes Cutting Factories, Inc., 505 Fifth
 Ave., New York City

Wheel Pullers

Armstrong-Bray & Co., 315 N. Sheldon St.,
 Chicago, Ill.

Wheels, Grinding

Chicago Wheel & Mfg. Co., N. C. Tool Div.,
 116 S. Aberdeen St., Chicago, Ill.

Woodworking Machinery

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Wrenches, Ratchet

Lowell Wrench Co., Worcester, Mass.

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Miller, No. 2 Garvin u.....\$ 195.
Press, arch.....195.
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Shaper, 20" S. & Mills.....195.
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Surplus Material & Machy. Co., 8735 Kercheval Ave., Detroit, Mich.
Drillers, 2 Detroit, 5 spindle horiz.
Grinder, No. 24 Gardner continuous feed, disc.
Grinder, No. 2 B. & S. universal.
Grinder, No. 2 Cincinnati plain.
Mill, No. 0 G. & L. hor. 3 1/2" cap. m. d.
Mill, No. 5C Becker vert., motor dr.
Mill, No. 3 B. & S. vert., s. p. d.
Mill, 24" Bullard, vertical turret.
Pipe threader, Landis, 4" mtr. dr.

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Brownell Machinery Co., - - - 150 Pine St., Providence, R. I.
Boring mill, 72" King, m. d.
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Grinder, 12"x36" Bath universal.
Grinder, 20"x120" Norton plain.
Lathe, 60"x30' Pond.
Lathe, 26"x16' Flather.
Lathe, 20"x10' Whitcomb.
Miller, No. 4 Cincinnati vertical.
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Gear cutter, G. & E. 26" s. p. d.
Gear cutter, G. & E. 60" m. d.
Gear hobber, G. & E. 24".
Grinders, B. & S. No. 2 surf. & univ
Grinder, P. & W. 14" vert. surf.
Grinder, B. & S. No. 13 mtr. dr.
Keyseaters, M. & M. No. 2 & No. 4.
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Milling mches., B. & S. No. 14 Cinc.
No. 14, Hendey No. 1-B, Kemp.
No. 3; Ohio No. 29; vertical slott.

attch., all universal; Kemp. No. 1,
LeBlond No. 3-H; Brown & S.
No. 3-B, s. p. d.; Brown & Sharpe
No. 3, all plain, Cincinnati 12"
Mfg.; Milw. No. 3-B & No. 1-A s.
p. d. plain; Cin. No. 3-S pl., s. p. d.
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Automatic screw machines, Hi-Speed, B. & S., No. 19.....	150.
Automatic screw machine, Gridley 4 spdl. "F", 4", 12", 14" and 24".....	\$150 to 750.
Automatic screw machines, Gridley 4 sp., Model G, 9/16" & 7/8".....	200 & 500.
Automatic screw machine, Gridley, 4½" single spindle.....	400.
Automatic screw machine, Cleveland, 1½" Model A, square pan.....	250.
Bolt cutter, 1" Acme, belt drive.....	175.
Drill, New Albany, h. s., motor drive, 110-60-1.....	100.
Drill, Leland Gifford, h. s., b. b., 14" swing, No. 2 M. T.....	150.
Drill, 2 spindle H. & W. h. s., b. b., 16" swing, heavy duty, class B.....	175.
Drill, 3 spdl., Leland-G., 20" swing, h. s., b. b., 12" travel, 26"x54" table.....	500.
Drill 4 spindle, Allen, h. s., b. b. No. 2 Morse taper, 14" swing.....	400.
Drill, 24" Sibley sliding head, b. g. and p. f., No. 4 M. T.....	125.
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Gang shitter, 30" Elgin, 26 gauge, with fingers and cutters.....	125.
Gear cutter, B. & S. No. 3, 26" for spur gears.....	200.
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Grinder, 6"x32" Norton plain cylindrical, arranged motor drive.....	300.
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Hammer, No. 5A High Speed, motor shelf, ½" capacity.....	275.
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 Boring mill, 42" Bullard, 2 heads.
 Boring mill, 48" Gisholt r.p.t., 2 hds.
 Boring mill, 72" Niles, 2 heads, m.d.
 Boring mill, horiz. 64" Niles, fl. type.
 Brake, 7'x10 ga. Chicago, m. d.
 Brakes, 3' & 10'x3/16" Chicago, m. d.
 Brake, hand, 10'x18 ga. Chicago.
 Buff. & pol. O. B. Bridge., 40" C-c.
 Bulldozers, Nos. 2, 4, 6, 9, 29, & 30.
 Cranes, Electric Traveling.
 Crane, crawler, gas., No. 2 Nor'wes.
 Drill, radial, 4' Prentice, t. a., b. d.
 Drills, rad. 3, 4, 5 & 6' Cin.-Bick-m.d.
 Drills, radial 4' & 6' Dreses, m. d.
 Drill, radial, 6' Fostick, s. p. d.
 Drill, Baker, table 23 1/2"x17", s. p. d.
 Drills, upright 10" to 36".
 Flanger, McCabe, 4" capacity, dies.
 Forging mch. 1 1/2" Acme, st. fr. b. d.
 Gear cutters, 11", 18" & 24" Gleason.
 Gear cutter, spur, D. S. cap. 2 1/2"x3 1/2".
 Gear cutter, spur, 36"x10" Newark.
 Grinder, crank, No. 4A Landis spec.
 Grinder, nail die, No. 101 Bridge., m. d.
 Grinder, disc, No. 8-20" Besly, b. d.
 Grinder, knife, 216" Bridge., 26" wheel
 Grinder, knife, 60" Bridgeport, m. d.
 Grinder, pl. 28"x120" Landis hyd. gap.
 Grinder, surf. 42" Spring, tbl. 18x84".
 Grinder, sur. 14" Pratt & W., m. d.
 Grinder, surf., Diamond; table 48x16"
 Grinder, No. 72 Heald sizematics.
 Hammer, Blacker, power, 35-lbs.
 Hammer, pwr., 100 lb. Brad. cush.
 Hammers, Nos. 2B, 3-B, 4B. Nazel.
 Hammers, steam, 600 lb. to 6000 lbs.
 Hammers, stm. dr. 1500 to 10000 lb.
 Lathe, 16"x6" LeBlond, q. c. g., d. b. g.
 Lathe, 18"x8" Lodge & S. grd. hd.
 Lathe, 24"x12" American, q. c. g., b. d.
 Lathe, 24"x14" LeBl., g. h. q. c. g. m. d.
 Lathe, 24"x16" Bridgeford, g. hd. m. d.
 Lathe, 30"x18" LeBl., g. h. q. c. g. m. d.
 Lathe, 48"x30" Pitts' h p. c. g., b. d.
 Lathe, 54"x27" Pond, g. h. p. c. g. m. d.
 Lathe, turret, No. 6 Warner & S.
 Lathe, turret, 18" Libby, m. d.
 Lathe, turret, 24" Steinle, 6 1/2" hole.
 Lathe, turret, 34" Gisholt, b. d.
 Lysholm tables, 72"x30".
 Miller, hand, No. 2 Pratt & W.
 Miller, pl. No. 2 Kempsmith, b. d.
 Miller, plain, Nos. 3 & 5 Cincinnati.
 Miller, pl., No. 5B Hyv. B. & S., s.p.d.
 Miller, rotary, 40" Ohio tilted, m. d.
 Miller, slab, 36"x36"x10" Ing. adj. r.
 Motors, a. c. & d. c.
 Nut mche., Wat-Far., 3" cold. b. d.
 Pickler, 4 arm Mesta, 10' radius.

Pipe machines, 8" Oster.
 Pipe mches., 6", 8" & 12" Williams.
 Planer, 36"x36"x8' Gray 3 hds. m. d.
 Pl., 56"x48"x12' Det. & H. rev. m. d.
 Planer, rotary, 48" Cleveland, m. d.
 Press, No. 3 Bliss, Stiles type.
 Press, cam, No. 69N Bliss, dbl act. inc.
 Press, o. b. i. Bliss, Nos. 15, 19, 20.
 Press, No. 55 Tol. s. s. st. bed 2'20x19
 Presses, Nos. 57, 57 1/2, 58 1/2 Toledo grd.
 Presses, trimming, United, m. d.
 Press, No. 64 Cons., 17"x17", str. 4 1/2".
 Press, No. 57 Toledo, 32"x32", str. 6".
 Presses, hyd. 200-ton Oilgear.
 Press, No. 96-A Toledo, d. c. 5" str.
 Press dbl. crk. No. 5 Bliss, 2" str.
 Press, No. 6 Bliss dbl. crank, 6" str.
 Press, screw, No. 87 Niagara.
 Press, toggle, No. 3 1/2 Bliss, b. d.
 Press, wheel, 300-ton, motor drive.
 Profiler, 2-spld., No. 14 Pratt & W.
 Punch & s., No. 6 L. & A. 4" thru 4 1/2".
 Punch & s., "C" Clev. 13 1/2", 4" m. d.
 Punch, mult., No. 5 H. & J. 10".
 Riveters, air, hammer, spinning.
 Rolls, bend 56"x3/16" Bertsch, int. t.
 Rolls, bending, 12"x4" H. & J. b. d.
 Roller, thread, Nos. 10, 30, 40 W.-F.
 Saw, No. 21 Higley, cold, 10'rd. m. d.
 Saw, cold, No. 6 Coch.-Bly, s. p. d.
 Saw, cold, 48" Newton, m. d.
 Saws, friction, Nos. 2, 3 & 4 Ryerson.
 Scale, sheet bundling, 2500 lbs.
 Screw mchs. Nos. 52, 53, 55 Nat. A.
 Screw mche., auto., No. 6B & S. s.p.d.
 Shaper, vert., Jones 10" stroke, m. d.
 Shapers, 16", 20", 24" & 36" G. & E.
 Shaper, 24" Flather and P. & J.
 Shear, circle No. 3 Bliss, 40"x20 ga.
 Shear, circle No. 15A Nia. 48"x16 ga.
 Shear, cir., 1" Newbold, die 14", m. d.
 Shear, o. e. 27" United, 8"x28" m. d.
 Shear, sq. 16"x4" Niag. 0" gap, m. d.
 Shears, alligator, 1 1/2", 2", 3" & 4".
 Shear, allig. No. 6 Mesta. 6" sq. m. d.
 Shear, angle, 6"x6"x1" H. & J.
 Shear, bevel, Lennox 8", b. d.
 Shear, sq. No. 196-F Nia. 8"x18 ga.
 Shear, guil. No. 5 H. & J. 4" sq. m. d.
 Shear, rot., 30" Quick, cap. 3-16" b. d.
 Shear, square 8 x14 ga., Ohl. b. d.
 Shear, sq. 12"x14 ga. Peerless, b. d.
 Shear, sq. 16"x4" Niagara, m. d.
 Slotters, 6" Newton, 8" & 21" Betts.
 Slotter, 72" Motron, m. d.
 Straitener, angle, Newbold, 4"x4"x 1/2".
 Straightener, 1 1/2", 4" rd. Abramson.
 Straitner, No. 2 K. & R.-7-r., cap 1 1/2".
 Table, rotary, 24"; graduated 360 deg.
 Tapping machine, vertical 4" Baker.
 Testing mch., Brinnell hard., type A.
 Upsetters, 1" to 6".
 Welder, butt, Tay.-Winf., 4" cap.

USED AND REBUILT MACHINERY

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Air compressor, 6x6 Curtis.
Drill, 3" Bickford, radial, s. p. d., t. a.
Drill, 4 spdl. Avey, h. s., b. b.
Gear hobber, No. 3 Barber-C. (3).
Grinder, No. 2 Bath univ., comp.
Grinder, No. 2 Wilmarth & M. surf.
Keyseater, No. 2 Davis.
Lathe, 16"x8" Springfield, q. c. g., t. & c.
Lathe, 19"x8" LeBlond h. d., q. c. g.
Lathe, 18"x10" Amer. q. c. g., comp.
Mill, No. 2 Kempamith, plain.

Mill, No. 2 Cin. uni., div. hd., compl.
Nibbler, No. 1 Campbell, 6" throat.
Press, No. 24 Consolidated, o. b. i.
Press, No. 192B Toledo, dbl. crank.
Saw, No. 2 Klemm metal cutting.
Screw machines, Nos. 4 & 6 Warner & Swasey.
Shapers, 20", 24" Steptoe crank, b. g.
Shears, 15A Niagara circle, 16 ga.
Tappers, No. 2 & 2X Garvin, vert.
Threader, 1" Landis bolt, Landis hd.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1211-1223 Hadley Street.

St. Louis, Mo.

Air compressor, 12"x10" Chgo. belted
Boltthreaders, 1" & 1 1/2" Landis.
Bolt threader, 2" National.
Boring mills, 36", 42", 60" & 72".
Bulldozers, No. 3, No. 4 and No. 8.
Drill, 1-spindle Avey.
Drill, 3" Mueller radial.
Drill, 5" Drees radial.
Drill, 6" arm American radial.
Generators (all sizes).
Grinder, 12"x60" Landis universal.
Grinder, 12"x36" Thompson univ.
Grinder, Hydroil hole.
Lathe, 16"x7" P. & W., geared head.
Lathe, 16"x9" Lehman.
Lathe, 14"x30" Fifeid.
Lathe, 26"x12" Walcott.
Lathe, 26"-48"x18" McCabe 2 sp.
Lathe, 18"x7" and 9" Lehman.

Lathe, 20"x14" American, q. c. g.
Miller, No. 2 Brown & Sharpe, pl.
Miller, Ingersoll slab, 27"x23"x14"
bed, 4 heads, motor drive.
Miller, Cincinnati, production type.
Oil engines (all sizes).
Pipe machines, 4", 8", 12" & 16".
Planer, 60"x48"x10" Gray.
Press, 35 Swaine.
Press, 92C Toledo, geared.
Punch, No. 14 W. W., 12" throat.
Sand slinger, Beardsley & Piper.
Shapers, 12, 16, 18, 20, 24 and 28".
Shear, circle, No. 310 Niag. 48" thr.
Turret lathes, No. 3A W. & S., 8"
hole, motor drive; No. 2A W. S.;
21 & 26" Steink; Gisholt 36".
Wheel presses, 48" & 70" hydraulic.

FOR SALE BY

International Machinery Co., 3178 Bellevue Ave., Detroit, Mich.

MILLS

No. 3 Van Norman, s. p. d.
No. 3 Cincinnati univ. comp., cone.

No. 4 Cincinnati pl. or vert. s. p. d.

GRINDERS

Nos. 1, 2, 3 Brown & Sharpe univ.
No. 11 Brown & S. plain, s. p. d.
No. 2 Diamond surface.
94" Diamond face m. d.

14" Pratt & W. vert., b. b. spindle.
Rivett & Heald internals.
16" Heald rotary.

DRILLS

No. 3 Avey-Matic power feed.
No. 2B Edlund three spindle, power feed.
Two-spindle Leland & Gifford.

One and two spindle No. 2 Colburn.
No. 363 Barnes all geared.
C12 Natco multiple.
No. 30 Natco multiple, round head.

PUNCH PRESSES

No. 75 Toledo inclined, 3" stroke.
No. 26 Bliss o. b. i. grd., 4" str., m. d.
6-No. 18 Bliss, 1 1/2" stroke, m. d.

P-4 Ferracute motor drive.
No. 5 Loshbough Jordon, flywheel.
4" stroke.

MISCELLANEOUS

6x60 Brown & Sharpe gear cutter.
11"x18" Gleason straight tooth.
16x6 Hamilton lathe, grd. hd. m. d.
18x8 Hendey lathes.

No. 3A Warner & Swasey.
No. 4 Warner & Swasey universal.
No. 1A Warner & S. bar & chuck (2)
Gibbs seam welder.

USED AND REBUILT MACHINERY

FOR SALE BY

James W. George, - - 1123 Beaufait Ave., Detroit, Mich.

Drills, 4' Morris radial, m. d.
Drills, 21" and 24" Cincinnati.
Drills, 1, 2, 3, 6 spindles.
Grinder, No. 11 Brown & Sharpe.
Grinder, No. 70 Heald.
Grinder, No. 3 B. & S. univ. comp.
Lathes, 16" and 18" Springfield.
Lathe, 18"x16" Hamilton, g. h.
Lathes, 18"x8" American 12 speed geared head, m. d. rebuilt, late type.

Miller, No. 2-B Milwaukee univ.
Miller, No. 4-B Brown & S. plain.
Miller, No. 3 Brown & Sharpe vert.
Planer, 36"x36"x12" Cincinnati.
Press, 80 ton Henry & Wright.
Shaper, 24" Gould & Eberhardt, m. d.
Shaper, 16" Gould & Eberhardt, m. d.
Thread miller, 12"x120" P. & W.

FOR SALE BY

Marr-Galbreath Machinery Co., 55 Water St., Pittsburgh, Pa.

Quality Not Reflected in These Low Prices.

Air comp., 12"x10" Chgo., a. c. mtr.
Air comp., 8x8" Ing.-Rand "ER1."
Air compressor, 5"x5" Ing.-R., m. d.
Air compressor, 6"x8" Worth, vert.
Bender & straightener, No. 4 H. & J.
Blowers, Buffalo Nos. 3E & 4E,
1/60/220, No. 25 3/66/220.
Bolt threader 1/2" Geometric b. or m. d.
Boring mill, No. 0 G. & L., 3 1/2" bar.
Boring mill, 34" Bullard vtl. thread
attachment.
Boring, mill, 36"-44" N-B-P., sh. m. d.
Buffer, 5 h. p. Hisey-W., 3/60/220.
Bulldozer, No. 6 W-W., clutch, b. d.
Crusher, No. 1 Williams, hammer
type, belt drive.
Crusher, Allis-Chalmers, 9x9", 2-roll,
belt drive.
Die sinker, No. 3 P. & W., r. t.
Driller, 5, 6-sp. Detroit, chucks.
Drill, 5, 6 spdl. L.-G., b. b., m. d.
Drill, radial, 3 1/2" Cin-Bick. t. a., m. d.
Drill, 30" Barnes, all geared.
Engine, Diesel 166 h. p. DeLaVergne
Gear cutter, 18" Newark.
Generator, 125 k. v. a. 3/60/220/900.
Generator, 50 k. v. a. 3/60/220/1200.
Grinder, 7 1/2 h. p., U. S. dbl. end, 3/60/440
Grinder, 5 h. p. Hisey-W., 3/60/220.
Grinder, disc, vert 30" Gardner, m. d.
Grinder, flex. shaft motor 1/2 h. p. 1/60.
Grinder, T. & C. No. 1 G. & L., for
motor drive.
Grinder, pl. 11 B. & S. 4x30" (cheap).
Hammer, Syntro ELEC., 1/60/110/.
Hammer, 30 lb. United, power.
Hammer, No. 2B & No. 4 B Nazel,
motor drive.
Hoist, 2-ton Sprague Elec., 3/60/220
volt motor.
Keyseater, No. 4 1/2 Burr, cap. 4 1/2"x18"
for m. d.
Lathe, bench, 7"x23" Goodell-Pratt.
Lathe, 11"x4" South Bend, chuck.
Lathe, 11"x6" Star, chuck.
Lathe, 24"x14" Hendey, g. c. g., tie-b.

Lathe, 24"x16" LeBlond, 6" raising
blocks, chuck.
Lathe, 12"x8" R. P., g. h., s. p. d.
Lathe, 18"x8" L. & S., q. c. g., t. a.
Lathe, 32"x14" Draper, cone, chuck,
t. a.; for m. d.
Lathe, 20"x8" Hendey, tie bar.
Lathe, 14"x19" Fay automatic.
Miller, No. 2 Rockf'd. hand, on col.
Miller, plain, No. 2A, Hendey, s. p. d.
Miller, No. 4 Ohio, table 101".
Pipe machine, 10" Cox., b. d.
Planer, Gray, 56x48x10", 4 heads.
Press, arbor, Nos. 1 & 3 Greenard;
30-ton Lourie.
Press, Arch, No. 3A Mossberg dial
feed, 12 positions.
Press, D. C. No. 138A Stoll, 3" stroke.
Press, horn, No. 2 Michigan.
Press, horn, 42-h. p. Toledo.
Presses, o. b. i., 8, 15, 19, 20 Bliss.
Punch, S.E., 24" tht. 1/2"x1 1/2", m. d.
Punch, S.E., 38" tht. 1 1/2"x1 1/2", m. d.
Punch & sh., L. & A. s. e., 16" tht.,
plain jaw, for m. d.
Riveter, Hanna Pinch Bug, 20" tht.,
18" high.
Riveter, No. 5A, Hi-Speed, m. d.
Rolls, bending, 5' 2"x8" cap. L. & A.,
d. e., m. d.
Saw, No. 9 Hunter, m. d. sharpener.
Shaper, 16" Ohio, crank b. d.
Shaper, 20" Cincinnati, motor dr.
Shaper, 21" Smith & Mills.
Shaper, 24" Baker b. g. V-ram, b. d.
Shear, angle, 6x6x1/2", H. & J. No. 2,
mounted on turntable, for m. d.
Shear, plate, 72"x1 1/2" cap. Bertsch,
24" gap, motor drive.
Shear, throatless, Marshalltown
rotary, cap. 1/2", m. d.
Transmission, No. 000 Reeves, 5:1.
Unishear, 36" throat, 14 ga., m. d.
Welders, arc, 35 amp., transformer.
Welding & cutting generator, Carbic

Partial List. Get Our Complete Stock List.

USED AND REBUILT MACHINERY

FOR SALE BY

United Machinery & Supply Co., 1241 Walton Ave., St. Louis, Mo.

Brake, box and pan, D. & K. 5'.
Brake, press, 4' 10 ga. D. & K., m. d.
Miller, No. 23 Ohio plain.
Nibblers, Campbell Nos. 1 & 1A, m. d.
Planer, 54" x 12', 4 heads, m. d.

Press, No. 1½ Bliss, back geared.
Punch & shear, No. 52 Beloit, m. d.
Rolls, Pyramid, 8½' x 1' cap.
Saw, friction, No. 3 Ryerson, m. d.
Shear, Quickwork, 16 ga., x5' th.

FOR SALE BY

Hess-Schenck Company, 3951 St. Clair Ave., Cleveland, Ohio

Drill, 21" Cincinnati with geared tapping attachment.
Drill, 2-spindle 24" Barnes gang drill, hump back.
Drill, 2-spindle 8" swing Sipp h. s., on 3-spindle column.
Gear shaper, No. 6 Fellows.
Keyseater, No. 3 Baker.
Lathe, 36" x 18' Pond engine lathe.
Miller, No. 3 Cincinnati plain, cone type.
Screw machine, No. 2 W. & S. plain head, lot of equipment.
Shaper, 24" Gould & Eberhardt cone type, extension base.
Squaring shear, 36" No. 211 Pexto power.
Squaring shear, 52" Kutscheid all steel power, 1' cap.
Turret lathe, 28" Gisholt, 6½" hole.
Wire drawing machine, No. 1 Cone Waterbury.

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S.

Pittsburgh, Pa.

Brake, No. 205 Chicago, 16' x 3/16", motor 3-60-220.
Bulldozer, No. 9 Williams-White; 24" stroke, 48" die space, weight about 70,000 lbs.
Car wheel borer, 42", hub fac. att.
Drill, 4 spdl. Colburn No. 4.
Hoists, elec. 1 & 2 t., 220 v., d. c.
Lathe, 18" x 8' L. & S. pat. hd., 230 v.
Lathe, 48" x 20' Betts-B., a. c., m. d.
Miller, No. 24 Rockford, cone.
Miller, No. 2AS Milwaukee, double over arm, single pulley.

Miller, vert., No. 5-C Becker.
Press, No. 24 Adriance horning, swinging table, 2750 lbs.
Press, s.s., No. 66 Cons. grd., 6" str.
Presses, Nos. 3½ & 4 Toledo, o. b. i.
Press, No. 3 Bliss dbl. cr. grd. 36" bet. uprights, 4" shaft.
Press Perkins dbl cr., 24" bet. hag.
Punch, L & A 1" thru 1", 24" tht.
Saw, 6" Peerless univ. shaping.
Shear, alligator, cap. 1½" sq. m. d.
Wire straightener, 3/16" Shuster, 6'

FOR SALE BY

Geo. M. Bernstein & Co.,

14 S. Clinton St., Chicago, Ill.

Drills, 1, 2, 3 sp. Sipp, h. s., b. b., No. 2 m. t., 8" overhang.
Drill, No. 2, 2 spindle Aveymatic.
Drills, 1 & 4 sp. Avey, h. s., b. b.
Drill, 4 sp. Allen, h. s., b. b.
Gear hob., No. 12 B-C & 12" G. & E.
Grinder, No. 11 B. & S. self con. pl.
Grinder, No. 2 Reid Bros. auto. surf.
Grinders, Nos. 2, 3 W. & M. sur. cks.
Hardness tester, No. 24 H Rockwell.
Lathe, 13" x 8' Willard semi-q. c. g.
Lathe, 14" x 6' Hendeey, q. c. g.
Lathe, 18" x 8' Walcott q. c. g., t. a.
Lathes, No. 0 B. & O. turret collets.

Lathe, 20" x 12' Brad. q. c. g., t. a.
Miller, No. 0 B. & S. univ., equip.
Millers, No. 1 Kemp. univ., equip.
Miller, No. 1 U. S., hand.
Miller, No. 3 B. & S. pl., arr. m. d.
Miller, No. 2 Rock'd, plain, s. p. d.
Miller, No. 2 Rock'd, univ., s. p. d.
Millers, No. 2 Garvin duplex.
Shaper, 16" Cincinnati b.g., rev. tbl.
Shapers, 16" Smith & Mills, b. g.
Shaper, 17" Averbek, b. g., crank.
Shaper, 21" American, b. g.
Shaper, 24" American, b. g.
Trip hammer, 100 lb. Little Giant.

USED AND REBUILT MACHINERY

FOR SALE BY

Chas. L. Molitor Machinery Co., 120-124 S. Clinton St., Chicago, Ill

LATHES

- | | |
|-----------------------------------|------------------------------------|
| 14"x8' Rockford tap. draw. att. | 16"x6' American. |
| 14"x6' Lodge & Shipley tap. att. | 18"x8' Hoyer & Emmes. |
| 16"x6' Sundstrand tap. draw. att. | 18"x8' Reed-Prentice grd. head. |
| 16"x6' LeBlond tapping att. | 20"x16' Oliver tapping attachment. |

MILLING MACHINES

- | | |
|--------------------------------------|----------------------------------|
| No. 3 Kempsmith universal. | No. 4 Oesterlein rapid product. |
| No. 3B Becker-Brainard universal. | No. O. Y. Brown & Sharpe. |
| No. 1 1/2 Becker-Brainard universal. | Nos. 1 & 2 Knight mill. & drill. |
| No. 1 Kempsmith plain. | 8" Pratt & Whitney automatic. |
| Nos. 2 & 3 Becker vertical. | Variety hand millers. |

SCREW MACHINES

- | | |
|--|---------------------------------------|
| No. 4 Warner & Swasey universal. | No. 4 W. & S. hex. tur.. 1, 2, plain. |
| Nos. 4 & 6 W. & S. b. g., f. h., p. f. | Nos. 1B, 6 & 7 Foster. |

MISCELLANEOUS

- | | |
|-------------------------------------|-------------------------------------|
| Bolt cutter, 1" & 1 1/2". | Grinder, No. 2 W. & M. surface. |
| Boring mill, 48" Niles-B., 2 heads. | Grinder, No. 2 Norton universal. |
| Die slotter, Garvin. | Hack saws, 6" & 9" h. s. power. |
| Drill, 4' American radial. | Miller, P. & W. double hd., spline. |
| Grinder, 24" disc. | Planer, 48"x48"x16' Cleveland o. s. |

FOR SALE BY

Belyea Company, Inc.,

150 W. 18th St., New York, N. Y.

D. C. MOTORS

Adj. Speed—230 Volt

H. P.	TYPE	SPEED
1-1500	West.	470/600
1-300	Cr. Wh.	208/400
1-250	El. Dy.	300/900
3-120	G. E.	300/750
1-100	West.	365/600
3-80	Diehl	500/1100
1-60	G. E.	400/1050
2-50	West.	225/800
1-40	West.	300/900
1-35	West.	500/1500
1-35	Cr. Wh.	800/1600
1-25	West.	400/1200
3-25	West.	650/2200
1-20	West.	650/1300
2-20	West.	375/1500
20-20	G. E.	650/1950
1-20	West.	500/1500
1-20	G. E.	500/1500
2-15	El. Dy.	300/900
1-15	West.	600/1200
6-15	West.	400/1600
1-10/14	El. Dy.	300/1200
30-10	West.	500/1500
20-10	G. E.	600/1800

MOTOR GEN. SETS.

- 500 k. w. G. E., D.C. Gen. 250/275 v. comp'd. inter pole, 720 r. p. m., coupled to 700 h. p. G. E. Type AT1, Synch. Motor, 3 ph., 60 cy., 720 r. p. m., 2200/440 v.
- 175 k. w. G. E., D. C. Gen. 275 v. comp'd. interpole, dir. conn. to 290 h. p. G. E. Synch. Motor, 2300/440 v., 3 ph., 60 cy., 720 r. p. m.

A. C. MOTORS

Synch. Type

H. P.	TYPE	VOLTS	SPEED
1-2850	G. E.	2300/4150	450
1-675	Al. Ch.	2200/550	900
1-600	G. E.	2200/550	257
1-260	Al. Ch.	2200/440	720
1-125	West.	2300	900
1-50	G. E.	440/220	1200
1-35	G. E.	440/220	1200

SLIP RING

1-1200	West.	2200	360
1-600	G. E.	2300/550	257
1-600	G. E.	2300/440	705
1-450/360	West.	2200	875/700
1-400	West.	2300	514
1-400	West.	550	505
1-300	G. E.	550	575
1-250	F. Morse	2200	1200
1-250	West.	2300/440	700
2-200	West.	220/440	900
1-200	G. E.	220/440	900
1-150	G. E.	440	1750

SQUIRREL CAGE TYPE

1-300	Cr. Wh.	2300/220	580
1-250	West.	2300/440	580
1-150	G. E.	220/440	900
1-150	West.	220/440	720
1-150	West.	220/440	580

ENGINE GEN. SETS.

- 1-400 k. v. a. Cr. Wh., 240 v. 3 ph., 60 cy., 120 r. p. m. to Hamilton Corliass Engine.
- 1-180 k. w. G. E. Type ATB, 2300 v. 3 ph. 600 r. p. m., 60 cy. Geared to Delaval Steam Turbine.

Above is Only Partial Listing. We Specialize in All Electrical Equipment, Motors, Pumps, Generators.

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FOR SALE BY

Herben Machinery & Equipment Co., 30 S. Clinton St., Chicago, Ill.

Brakes, apr., 8', 10', 12, 14, 16, 18 ga.
Brakes, press, 10' 10 ga., 10' 1/2".
Drills, 14, 16, 26, 36", 1, 2, 3, 4-spd.,
Lathes, large stock.
Presses, Nos. 2, 3, 5 L. & J. No. 5
Federal, o. b. i., geared.
Rolls, 3, 6, 8' and 10'.
Saws, Nos. 1, 2, 5 Marvel; 6x6, 9x9

high speed Peerless.
Screw machines, auto., 1, 1 1/2 Gridley;
m. d. Nos. 0 & 00 B. & S.
Shapers, 7", 16", 20", 24"
Shears, pwr. sq., 10' 1/2"; 10' 14 ga.
Slitter, 36" Yoder "G", m. d.
Welders, spot, 5 and 10 k. w.
Welders, arc, 200 and 300 amp.

FOR SALE BY

The O'Brien Machinery Co.,

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Boring mill, 42" Bullard vert. 2 hds.
Column facer, 14" Espen-Lucas.
Grinder, No. 55 Heald.
Grinder, No. 2 Van Norman Piston.
Grinder, 10"x52" Landis, self contained, plain.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. NBP. steam forg.
Hammer, 2000 lb. Chambersburg double frame, steam.
Keyseater, No. 2 Baker, 2" cap., belt drive.
Lathe, 27"x12' L. & S. geared head.
Lathes, 18"x8' Bradford, mtr. dr.

Lathe, 24"-40"x22" McCabe, belt.
Lathe, 68"x38" Bement, motor drive.
Miller, No. 3 K. & T., univ. table 55"x15", range 34"x12"x19".
Miller, No. 4 Cincinnati universal, belt driven, table 57"x14".
Miller, No. 4 Cincinnati vertical, single pulley drive.
Pipe machines, 2, 4, 6, 8 and 12" belt and motor drive.
Punch, beam, type IG Clev., 24" bms.
Punch, No. 3 Southwark 4x1", mtr.
Shapers, 14, 16, 20 & 24" various makes
Shear, 8' Niagara, 15" gap, 2-16" cap.

FOR SALE BY

Brown Machinery Co.,

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Brake, Chicago Steel, 8' 10 gauge, power, motor drive.
Drills, 14, 16, 20, 22, 24 & 42"
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Grinders, cylindrical, 10x30" Norton, 12x36" Modern, self-contained.
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Groover, power, 6' horn.
Hammers vertical 40 & 80-lb. Perfect; 75-lb. Dupont; 130-lb. Justice.
Lathes, 16"x6' & 8' Monarch c. g.; 16"x8' Monarch grd. head m. d.; 18"x12' American grd. hd., taper & turret attach.; 20"x8' LeBlond, heavy, q. c. g.; 26"x12' Putnam, taper attach., 36"x18' Niles c. g.
Lathes, turret, all sizes.
Millers, plain, No. 1 1/2 American; No. 3 Brown & Sharpe; No. 3B Owen vert. attach.; No. 3 1/2 Fox; No. 2B & No. 3B Milwaukee.
Millers, universal, No. 2 Hendey-Norton; Lincoln type, No. 4 Hendey; slab, Briggs type No. 11.

Planer, 42"x42"x10' Pond.
Presses, straight side, No. 73 Swaine; No. 7 Zeh & Hahnemann; No. 68F Niagara; No. 92 1/2 H Toledo; No. 408B Bliss toggle.
Presses, o. b. i. Nos. 5 & 6 Consolidated comb. grd.; Nos. 1, 2, 3, 4 Lashbough-Jordan; No. 33 Swaine
Punches, sgl. end, Cleveland "C" 26" thr. 1/2" in 1/2"; Rock River Style L rapid action, 24" thr. 1/2" in 1/2"; No. 6 L. & A. 24" thr. 1/2" in 1/2"; No. 7 L. & A. 10" thr. 1/2" in 1/2".
Punch & shears, double end, No. 9C Beloit 12" thr. 1/2" in 1/2"; No. L-10 Badger 10" thr. 1/2" in 1/2".
Riveters, No. 5A High Speed 1/2" cap.; Grant 1/2"; Allen jaw riveter.
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Seamer, double, Swaine hand, 24 ga.
Shapers, 20" Columbia & Queen City; 24" Ohio.
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Shear, rotary bevel, 4" Lennox.
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FOR SALE BY

Ott Machinery Sales, Inc.,

Automatics, B. & S. Nos. 0, 2, 19;
Fay 14"x19"; Acme Nos. 53, 54, 55,
56; New Britain No. 452 & 652
14", 14" & 24" Gridley, 4 spindle.
Boring mill, 5" bar Niles.
Drills, Avey, Allen, Leland-G. 4-
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No. 4, power feed.
Elec. h. s. furnace, Hoskins 12x8x16".
Engraving machines, Keller, No.
E4, E5, BG482 and BG 724.
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& 75 h. s.
Gear generators, Gleason 8" mg. st.
bevel; Gleason 15" spiral bevel.
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No. 2 B. & S. universal & surface;
Cinti. No. 3 univ.; Norton plain,
6 x 32, 10 x 50, 14 x 50; Norton,
No. B-81, crank pin; 16x72 Norton,
crank pin; No. 2 Diamond surf.
Hammers, Billings & S. 1200 lb. bd.
drop; Chambersburg 1600 lb.; Erie
2500 lb.
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Hamilton, cone; 16"x6" & 9" Hamil-
ton, m. d.; 18"x16" Hamilton, geared

546 Second Ave., Detroit, Mich.

head; 36"x15" Bridgeford g. h.; 34"
x36" Acme turret, geared head;
J. & L. 3x36".
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Milling mchs., Nos. 12 & 33 Kemp-
smith Mfg.; No. 4-B Becker vert.;
No. 2 B. & S. vert.; No. 2 Cin'ti hi-
power pl.; No. 4 LeBlond pl., cone.
No. 2 Cleveland universal.
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12"x120" Pratt & Whitney.
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Cin'ti 48x36x8' 2-heads a. m. d.;
Cin'ti 60x60x20' 3-heads, a. m. d.
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Presses, Ferracute P2, 3, 4 & 5; Fer-
racute DG53 & 54; Bliss, s. s., s. c.
No. 48, 794 & 514; Toledo, s. s., s. c.
No. 594; Toledo, s. s., d. c. No. 92B,
Bliss, s. s., d. c. No. 3 C & D, No.
4A, No. 5 A & C; Bliss, gap, d. c.,
25A, & B. Bliss, d. c. Toggle No.
405B & 407A; B & 412; Ferracute
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24" bar Cleveland horizontal.
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Double disc grinders—all sizes.

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12"x8" Sebastian, geared head.
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24"x12" Lodge & Shipley, q. c.
32"x12" Boye & E., cone head q. c.
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50 O. B. I. presses—all sizes.
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200 amp. Lincoln arc, m. d.
20 k. w. National spot.

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No. 3 Kempsmith plain cone drive.
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Brakes, 6", Chicago power 3/16".
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Special—4 h. p. General Electric Centrifugal Blower.

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Grinder, No. 2 Cincinnati, centerless.
Hammer, No. 6B Nazel.

Miller, No. 2-B Brown & Sharpe.
Miller, 5B heavy B. & S., rap. trav.
Miller, No. 3 Cincinnati universal.
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Nibbler, Gray 3/16"-34" throat.
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16x14 and 10x14 Ingersoll-Rand compressor, 600 cu. ft. with unloader... 425.

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Shaper, 20" American, auto-oiled.
Wheel press, N. B. P., 400 ton.

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Telephone Lincoln 6320

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Boring bar, Rochester, 4" spindle.
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Press, No. 5 Consol. comb. geared.
Press, No. 22 Bliss, roll feed.
Roll, 10', 3" motor drive.
Shaper, 20" American, auto-oiled.
Wheel press, N. B. P., 400 ton.

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Midwest Equipment Co.,

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Miller, No. 1 Kempsmith pl., comp.
Miller, No. 2 LeBlond, universal.
Miller, No. 2 Cinc., univ. complete.
Miller, Kempsmith No. 3, vert. att.
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Brown & Sharpe, automatic.
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Complete stock of Punch Presses in all sizes. Send for list.

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Vertical & Horizontal Boring Mills

- 5" bar Detrick & Harvey floor type.
- 3" bar Lucas, Table type.
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- 10" N. B. P. heavy, grd. feeds, m. dr.
- 36" Bullard vertical turret, motor dr.
- 36-44 Pratt & W. vert. turret, m. dr.

Lathes

- 14"x6" Hendey, (3).
- 18"x10" American, gd. hd., motor dr.
- 16"x8" American.
- 18"x8" American, (3).
- 20"x8" American, gd. hd. motor dr.
- 36"x26" Bridgeford gd. hd., motor dr.
- 46"x28" H. S. & G. gd. hd., mtr. dr.
- 24-48x14" McCabe gap gd. hd., m.
- 24-48x18" McCabe gap, belt drive.
- 33"x12" L. & S. heavy q. c. g., belt.
- 36"x22" New Haven late q. c. g., belt.

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- 1, 2, 3, 4 spindle High Speed. Allen and Leland & Gifford.
- 24" & 30" sliding head, tapping, m. d. Snyder and Aurora, single spindle.
- 3" Cincinnati-Bickford plain radial.
- 4" Niles Universal radial.
- 5" Cincinnati-Bickford plain radial.
- 6" Amer. Tri. Purp. plain rad., m. d.
- 6" N. B. P. right line radial, motor dr.

Milling Machines

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- No. 3A Brown & S. Universal, (2).
- 24" Cincinnati duplex, late type.
- No. 3-B Milwaukee pl., late type (2).
- No. 25 Becker Plain, (3).
- No. 2 Kempnath Maximiller, m. d.
- No. 3 Hendey plain, cone drive.
- No. 3 Cincinnati plain Hi-Pr. gd. hd.
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- 16" & 20" Smith & Mills, back geared.
- 20" G. & E. High Duty gear box m. d.
- 24" G. & E. High Duty back gd. cone.
- 24" American Heavy gear box, m. d.

Grinders

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- 84" Diamond Face, motor drive.
- 16"x48" Landis crankshaft self con.
- No. 65 Heald cylinder, Like new.
- 10"x24" Landis self contained.
- 14" Pratt & Whitney Vert. Surface.
- No. 3 Abrasive Surface.
- No. 19, 53 Besly vertical disc, belt.

Presses

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- No. 77 Bliss-Consolidated, geared.
- No. 92½ C Toledo, st. side, d. c. gd.
- No. 203 D Toledo, st. a., d. c., flywheel
- No. 74 Bliss-Cons. gap frame flywheel.
- No. 72 Cons. gap frame, geared (2).
- No. 5 V. & O. open back inc. fly.
- No. 8 Perkins knuckle joint embossing.

Brakes

- 13"x3/16" Geo. Ohl brake, belt.
- 10"x10 ga. Loy & Nawrath, belt.
- 10"x¼" Loy & Nawrath brake, m. d.

Shears

- 6"x10 ga. Niagara 16" throat, m. d.
- 8"x3/16" Ohl squaring, m. d.
- 13"x¼" Hyde Park, 18" throat, m. d.
- 13"x14 ga. Ohl Squaring, belt.

Miscellaneous

- 1¾" & 1¼" Gridleys Model F.
- 50"x¾" Niles Straightening Rolls.
- 10"x½" Bertsch Bending Rolls.
- 20"x1" Wickes Bending Rolls, m. d.
- 8" Jarecki Pipe Machine.
- No. 13 B. & S. Standard Gear Cutter.
- 103"x20" G. & E. Gear Cutter.
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- 48" Ryerson Friction Saw.

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 48" Cincinnati Plain Auto., spur drive.
 24" Cincinnati Plain Automatic,
 National Standard, latest.
 24" Cincinnati Duplex Auto., m. d.
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 No. 2A, 2A Heavy, 3A Hvy. Brown
 & Sharpe Universal, s. p. d.
 No. 1½, 2, 3 Brown & S. Univ., cone.
 No. 1½, 2, 3 Cincinnati Univ., cone.
 No. 3 Kempnath Universal, cone.
 No. 2, 3, 4, 5 Cincinnati Pl., s. p. d.
 No. 1½, 2, 3, 4 Cincinnati Pl., cone.
 No. 3B, 4B Heavy, 5B Heavy Brown
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 No. 2A, 3A W. & S. Univ., chucking.
 No. 4 Warner & S. Univ., chucking.
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90"x54" Pond, m. d., 2 carriages.
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 Head, motor drive, taper.
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 30"x12" American, m. d., 12 speed.
 22"x8" American, taper, 12 speed.
 22"x14" Lodge & Shipley, motor dr.

20"x10" American, motor drive.
 20"x8" American, 12 speed, m. d.
 20"x8" American, 8 speed, m. d.
 18"x8" Lodge & Shipley Selec. Hd.
 18"x8" American, 12 speed.
 18"x6" American, 12 speed.
 16"x6" Lodge & S., m. d., taper.

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6" Amer. Triple Pur., gr. box on base.
 4" Amer. Tri. Pur., gr. box on arm, late.
 No. C12 Natco Multiple Spindle.
 No. 30 Natco Multiple Spindle.
 No. 26C Fox Multiple Spindle.

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 1, 2, 4, 6 spindle No. 2 Avey, B. B.
 1, 6 spindle No. ½ Avey B. B.
 22", 26", 34", W.F. & J. Barnes Upri.
 20, 22, 26" Barnes Camel Back.

GRINDERS

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 3 motor drive.
 No. 70 Heald Internal, clutch head.
 No. 50, 55, 60, 65 Heald Cylinder.
 No. 2, 3, 78 W. & M. Auto. Surf.
 No. 25 Heald Rct. Surf., m. d., hyd.
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 No. 3 Brown & Sharpe Planer Type.
 No. 2 Cincinnati Universal Cylindrical.
 No. 2 Cincinnati Plain Cylindrical.

No. 1½ Cincinnati Tool & Cutter.
 No. 1, 2 Brown & Sharpe Universal.
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 No. 4 Landis Universal.
 6x10, 10x24, 10x36, 10x52, 12x36,
 12x52, 12x72, 16x32", 16x52",
 16x72" Landis Plain, Self-Con-
 tained Cylindrical.
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 No. 18H, 18HW G. & E. Gear Hob.
 No. 12 Barber-C. Gr. Hob., dbl overarm
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MISCELLANEOUS

No. 0-62" H. & J. Straight Roll, m. d.
 No. 24 Greenard Arbor Press, m. d.
 No. 3, 4 Greenard Arbor Presses.
 No. 5 Atlas Arbor Press.
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 Detroit Spot Welder, 30 KW.
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 No. 6 Cochran-Bly Cold Saw, m. d.

½", 1½" Landis 2 spindle Bolt Cutter.
 Brown & Sharpe Bench Centers.
 No. 2 Baker Keyseater.
 6 spindle 1" Acme Nut Tapper.
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 No. 5 Williams & W. Bulldozer, belt.
 6x6" Racine Hack Saw.
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No. 5-B Swiss.

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No. 44-45 Universal Tri-Way.

No. 2 Lambert, 4" bar.

No. 0 Giddings & Lewis.

No. 34 Universal, 3 1/2" bar.

2 1/2" bar Cleveland.

Boring Mills (Vertical)

24" Bullard, "New Era".

32" King.

36" & 42" Bullard "New Era"

61" Bullard Maxi-Mill.

62" Colburn, Heavy Duty.

72" Colburn, m. d.

72" King.

10" Niles.

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1, 2, 3, 4, 6 Spindle L.-G.

1, 2, 6 Spindle Henry & Wright.

4 Spindle Sigourney.

Drills (Mfg.)

Boley Multiple Drillers.

Nos. 2 & 14 Colburn, 1, 2, 4 spindle.

24" Cinn - Bick., slid. head.

No. D-4 Colburn.

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3' Western, timken bearing, m. d.

3' American.

5' American, full universal.

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Nos. 3 & 12 Barber-Colman.

Nos. 9-H & 18-H G. & E. hob.

Nos. 6, 65, 61, 612, 7 Fellows.

6" & 18" Gleason bevel gear.

37" Gleason bevel planer.

Grinders (Plain)

Nos. 10, 11, 12 B. & S.

6" x 32" Norton.

10" x 24" 36" 50" Norton.

10" x 72" Norton.

10" x 36" 52" Landis.

14" x 36" 50" 72" Norton.

18" x 96" Norton, m. d.

20" x 120" 168" Landis, m. d.

Grinders (Univ.)

No. 2 & No. 2 1/2 Bath universal.

No. 4 Landis.

Grinders (Misc.)

No. 2 Cincinnati Centerless.

No. 14 Landis, Internal.

No. 70 Heald, Internal.

No. 10 Blanchard, surf., m. d.

No. 5 Springfield, surface.

No. 3 Abrasive, surface.

14" x 36" P. & W. surface.

15" x 17" x 72" Norton, o. s. surf.

36" x 84" Diamond, hyd. face.

Lathes (Screw Cutting)

8" Sundstrand Stub Lathe.

No. 12 LeBlond Multi-Cut.

13" x 48" P. & W., Model "B"

16" - 184" x 6" L. & S. sel. g. h.

18" - 184" x 8", 10" L. & S. sel. g. h.

18" - 204" x 6" & 8" L. & S. sel. g. h.

20" - 224" x 8", 12" L. & S. sel. g. h.

24" - 274" x 12", L. & S. sel. g. h.

25" x 24" LeBlond geared head.

36" - 404" x 14" L. & S. sel. g. h.

36" x 18" L. & S. pat. head.

36" x 18", 30" Rahn-Larmon.

66" x 21", 36" Putnam t.g., m. d.

Millers (Thread)

4 1/2" x 12", 6" x 48", 6" x 80" P. & W.

No. 6 Lees-Bradner.

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No. 3-B, No. 4-B Milw., s. p. d.

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Millers (Mfg.)

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18" & 24" Cincinnati automatic.

Millers (Vert.)

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No. 3 Cinn. h. p., motor-in-base.

No. 4 Cincinnati, h. p., s. p. d.

No. 5 Brown & Sharpe.

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22" x 22" x 5' Gray.

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30" x 30" x 6', 18" Cincinnati.

36" x 36" x 8', 18" Cincinnati.

36" x 36" x 10' Gray, rev. m. d.

36" x 36" x 12' Liberty, o. s.

36" x 36" x 24" & 48" x 48" x 10' Gray.

48" x 48" x 14' Liberty, o. s.

56" x 56" x 32' Cincinnati.

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No. 96-F Toledo, double crank.

No. 106 Bliss, gap.

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2 1/2	7/16	3/4	6.60	2.64
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Marshalltown Throatless Shear, 1/4 cap.
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 No. 3 Cin. Pl. Mill. Mche. cone dr.
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 32" Cinc. M. D. Heavy duty shaper.
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 20"x10" Hendey Lathe dbl. friction C.S.
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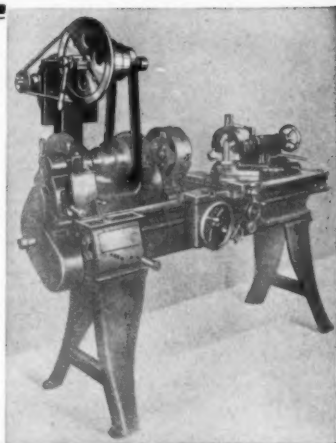
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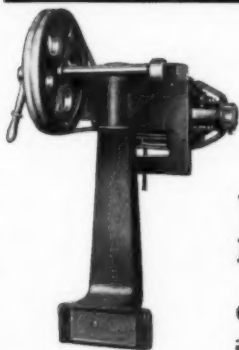
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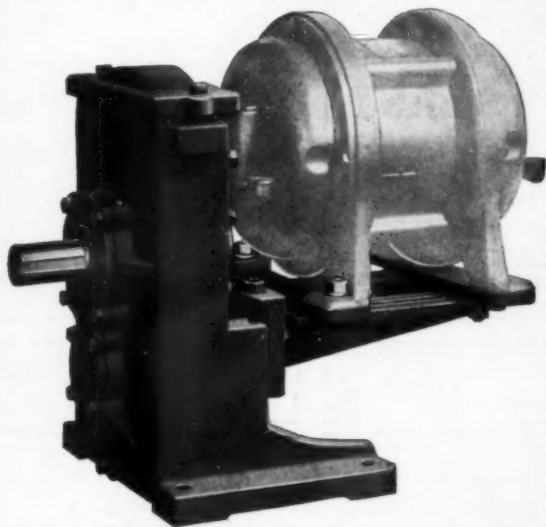
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